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SOME RECENT ADVANCES IN THE CHEMISTRY OF NUTRITION *

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NEW YORK

So numerous have been the recent advances in the chemistry of nutrition that to make a short review anything more than a list of items will require restriction of scope to a limited part of the field. Hence I shall restrict myself to some recent work on the factors through which, or the ways in which, food may serve to improve the general condition of nutrition; and, after touching on a few of the most recent observations, attempt some consideration of the interrelations involved and of what may be accomplished by the coordinated effects of simultaneous enrichment in the intakes of these factors.

VITAMIN G

I will first consider vitamin G, recently differentiated from vitamin B.

In the study of vitamin G, as of vitamin A and of calcium, the rat has been found to be a good experimental animal. Throughout this paper, however, my purpose is to deal with problems of human nutrition, the rat being employed simply as a suitable laboratory reagent or instrument of research. This may be true even when the appearances of the effects of a given nutritional deficiency are considerably different in the two species. The first three illustrations are from the work of Dr. Bertha Bisbey now in progress in my laboratory.

It should also be emphasized that the penalties of such ill balanced diets as are here being considered come only slowly. This fact may leave room for skepticism, but it also gives time and opportunity for nutritional rehabilitation even when the patient has been for a relatively long time on an unfortunate food supply. In general, the earlier the age the quicker the response; but when even a month old rat, corresponding to a child in its third year, is placed on a diet well suited to its needs in other respects but lacking vitamin G, there may be an interval corresponding to many months in the human life cycle before any distinct signs of nutritional deficiency appear; and there is considerable individual variability as to what sign appears first. Sometimes this is a stunting of growth usually accompanied by diarrhea; sometimes it is a more distinctive symptom, such as soreness of the mouth (figs. 1, 2 and 3) or a dermatitis first evidenced by the falling of hair either around the eyes or in bilaterally symmetrical areas on the shoulders and back, giving rise in the one case to the so-called spectacle-like and in the other to the saddle-like dermatitic patterns. And usually there also develops a generally weak condition with depressed and apprehensive attitude, with increasingly severe digestive disturbances ending in death; or (especially if the diet, while deficient in vitamin G, contains a little of it so that death is postponed) there may develop a pronounced picture of premature senility [1] (figs. 4 and 5).

Most emphatically I do not offer vitamin G as a panacea for the prevention of premature senility and the falling of hair! But just as a lack of this factor brings about a condition of malnutrition which may contribute to premature senility, so a liberal intake of vitamin G contributes to a better than average nutritional condition and thus to what McCollum and Simmonds [2] have aptly termed "the preservation of the characteristics of youth."

Time permits only brief reference to the difficult problem whether or not the condition of vitamin G deficiency should be considered an experimental pellagra and whether this nutritional factor should be regarded as a pellagra-preventing vitamin.

Laboratory research appears to have elucidated some but not all of the causes of confusion which this problem presents. Thus, several facts have been found which go far to explain the differing results obtained in different laboratories as to the appearance of pellagra-like symptoms. The rough, red areas which the term pellagra suggests are usually so late a manifestation of the vitamin G deficiency as easily to escape observation unless the experimentation is both fortunately planned and very prolonged; for this particular symptom may fail to appear, not only because the experiment is not sufficiently prolonged by the observer but also because it is terminated by the death of the experimental animal before the "typical" rough, red areas have developed. Just as on a strictly vitamin B free diet death often occurs before the appearance of a typical polyneuritis, so on a strictly vitamin G free diet death often occurs before the dark red areas of the "characteristic" (?) dermatitis have developed. It is when the food is not entirely devoid of the vitamin but contains it in too small an amount for the needs of normal nutrition that the condition regarded as most clearly characteristic of beriberi or of pellagra, as the case may be, appears.

The previous nutritional history may also have an important influence on the appearance of pellagra-like symptoms—partly, no doubt, because the body carries differing amounts of vitamin G in its tissues according to the relative abundance of this factor in the previous

* Read before the Section on Pharmacology and Therapeutics at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. Sherman, H. C., and Sandels, M. R.: J. Nutrition 3: 395 (Jan.) 1931.
2. McCollum, E. V., and Simmonds, Nina: The Newer Knowledge of Nutrition, ed. 4, New York, Macmillan Company, 1929.

food of the individual or the family. The age or condition of development at the time of the vitamin G deficiency doubtless also influences the incidence of particular symptoms.

For these and other reasons there has been such divergence of experience in different laboratories as to cause skepticism in the minds of some workers; but when these causes of variation are taken duly into consideration there now seems no doubt that the condition of vitamin G deficiency is an experimentally reproducible reality, whether or not it should be called "pellagra-like."

Fig. 1.—The sore mouth, in the so-called pellagra-like condition resulting from lack of vitamin G, is apt to be accompanied in the rat by a soreness and swelling of the nose as shown here, these symptoms often preceding any appearance of extensive dermatitis.

Meanwhile, evidence of the importance of vitamin G in normal nutrition is rapidly accumulating. THE JOURNAL has editorially remarked on the increasing recognition and appreciation of the difference between "passable" and "buoyant" health. It is doubtless largely as contributing to buoyant or positive health that the "protective foods" act to preserve the characteristics of youth as described by McCollum, and probably also to prevent and to alleviate much of the so-called degenerative disease as described by Langstroth [3] at the Portland session of the Association. At any rate, it seems reasonable to expect that most if not all therapeutic measures can be aided by the simultaneous improvement in general nutritional condition which recent research on foods has made possible.

It seems to be true of vitamin G, as also of vitamins A and C, that the optimal amount is much higher than the minimal ("actual") requirement; in other words, that the body is able to make good use of a much more liberal intake than can be proved to be absolutely necessary. In the recent experiments of Ellis [4] in my laboratory it has been found that, with food consumption practically the same per unit of body weight at a given age, growth and development continued to show a favorable response to increased liberality of vitamin G intake well above what suffices to prevent any actual sign of deficiency. Vitamin G also appears to contribute to the betterment of longevity induced by Sherman and Campbell [5] through improvement of an already adequate diet. Thus, although the existence of vitamin G has been but recently recognized, there is already evidence that it is a nutritional factor of very far-reaching significance.

The vitamin G which is thus designated at present as *a* nutritional factor may include more than one chemically individual substance. Several workers have found reason to think that the substance essential to growth and that which protects from dermatitis are different, or that more than one growth essential may here be involved, or that both these possibilities may be true. To me, as to many others, it now appears that the present vitamin G is probably a multiple rather than a simple factor; but, if this proves true, it will detract nothing from the importance of this factor to nutrition and health.

3. Langstroth, Lovell: Relation of American Dietary to Degenerative Diseases, J. A. M. A. **93**: 1607 (Nov. 23) 1929.
4. Ellis, L. N.: Columbia University Dissertation, not yet published.
5. Sherman, H. C., and Campbell, H. L.: Proc. Nat. Acad. Sc. **14**: 852 (Nov.) 1928; J. Nutrition **2**: 415 (March) 1930.

INTERRELATIONSHIPS OF NUTRITIONAL FACTORS

Let us now pass to a consideration of some interrelations of nutritional factors and the significance of some of these interrelations in the prevention or cure of disease and the promotion of positive health.

Probably each of the vitamins A, C and D bears an important relation to the metabolism of calcium and phosphorus in the development of bones and teeth. Especially as regards the relationship between vitamin D and calcium there is now a wealth of evidence, much of which is very recent.

Vitamin D undoubtedly plays a significant part in promoting the orderly development of the bones and teeth; but the evidence is conflicting as to how far it is a calcium conserving and how far only a calcium and phosphorus mobilizing factor. In the enthusiasm of the past few years, there has probably been a tendency to expect too much of vitamin D. Quite recently, however, two of the most active and thoroughgoing groups of workers in this field, the Wisconsin group [6] on the one hand and Shohl and his co-workers [7] on the other, have pointed out with emphasis and cogency that neither irradiation nor the ingestion of vitamin D is a panacea for the problems of the calcium requirement and that, while the vitamin influences the intermediary metabolism of calcium, the supplying of the

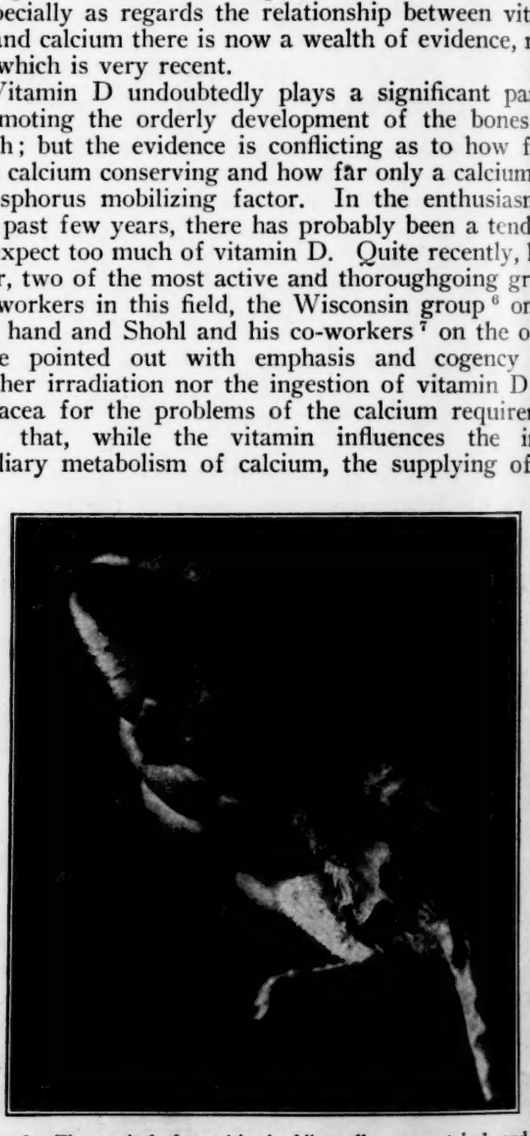

Fig. 2.—The typical dermatitis is bilaterally symmetrical and may appear around the mouth and nose, around the eyes, on the paws, on the shoulders or back, or elsewhere on the body. With the natural defenses thus impaired, sores become much more common and severe than when the general condition of nutrition is better. In the rat here shown, a large sore developed on the ventral surface.

body's quantitative needs must depend on the calcium content of the intake. Both the published and the unpublished observations of my own laboratory are also

6. Among other papers, Steenbock, Harry; Hart, E. B.; Riising, B. M.; Kletzein, S. W. F., and Scott, H. T.: J. Biol. Chem. **87**: 127 (May) 1930. Hart, E. B.; Steenbock, Harry; Tent, E. C., and Humphrey, G. C.: Ibid. **84**: 359, 367 (Oct.) 1929. Hart, E. B.; Steenbock, Harry; Kline, O. L., and Humphrey, G. C.: Ibid. **85**: 145 (March) 1930. Steenbock, Harry; Black, A., and Thomas, B. H.: Ibid. **85**: 585 (Jan.) 1930.
7. Among other papers, Brown, H. B., and Shohl, A. J.: J. Biol. Chem. **86**: 245 (March) 1930.

in accord with this view, and McCollum's experiments seem to lead to an even higher estimate of the optimal calcium intake.

While fully recognizing that the experimental evidence is in some respects conflicting and that there is still some divergence of opinion among investigators, one should, I think, conclude that after much study of vitamin D the importance of liberal calcium intake is more fully established now than it has appeared to be at any previous time.

Probably a larger proportion of the ordinary dietaries, both of adults and of children, can be improved by enrichment in calcium than in any other one chemical element. It is better to speak of the benefit of enrichment than of the danger of deficiency, because deficiency seems to be a somewhat ambiguous term whereas the benefit of a liberal intake of calcium is a matter of more positive knowledge to all who will study the experimental evidence.

The calcium balance experiments of Hawley [8] on children of different ages, with systematically varied intakes of calcium to find that which induced optimal retention of calcium by the growing body, were at once so careful and so comprehensive that they still seem to furnish the best evidence on this point. Though made before the realization of the existence and rôle of vitamin D, the experiments of Hawley provided amply for this factor in that before and during the experimental periods the children were much in the outdoor sunshine.

Optimal calcium retention in the growing child requires the joint action of a liberal provision of the antirachitic factor (whether by mouth or through the action of light on the skin) and a liberal intake of calcium in the food. For different individual children the calcium intake that will just support an optimal storage may range from 0.75 to 1 Gm. daily, the latter figure being a reasonably safe allowance to cover individual variations.

When the calcium intake is less liberal, the body may still be able to store calcium, but usually not at an optimal rate. Optimal development of the growing body involves the retention of relatively more of calcium than of other body-building material, for there must be an increase in the percentage of calcium in the body at the same time that it is growing rapidly in size and weight. Under these conditions, the optimal rate of calcium retention is the maximal rate that the healthy growing body can attain, and to fall short of this is for the body to remain calcium-poor as compared with what the calcium content should be, for the best development, at the given age.

It is an important fact, perhaps too often overlooked, that children who are growing normally in height and weight often have bodies which are more or less calcium-poor, in the sense just explained, with nothing to reveal this condition even on the most careful and searching physical examination. Obviously, the direct further study of this point by chemical analysis of the body to determine its calcium content at different stages of its growth on different calcium intakes cannot be done on the children themselves. But when one has recourse to this sort of experimentation on the rat (as a suitable deputy because of the likeness of his nutritional processes in this respect to those of the human body) it is found, as shown by Sherman and MacLeod [9] and by the still more recent work of Booher,[10] that the calcium-poor condition of body may continue, with no outward sign to reveal it, throughout the whole growing period.

8. Sherman, H. C., and Hawley, E.: J. Biol. Chem. **53**: 375 (Aug.) 1922.

9. Sherman, H. C., and MacLeod, F. L.: J. Biol. Chem. **64**: 429 (June) 1925.

RESULTS OF A DEFICIENCY OF CALCIUM

The influence of the calcium intake on the calcium content of the body is perhaps being the more slowly recognized because of the habit of thought which Liebig, with his great skill as a teacher and his characteristically emphatic manner of expression made current in his so-called law of the minimum, according to which that growth essential which is furnished in minimum amount (relative to the need for growth at a normal rate) will thereby determine the rate of growth, the organism growing only to the extent that it can grow to the normal composition of its kind. But nearly ninety years of research has now intervened, and any such dictum must be reexamined in the light of the fuller knowledge of today.

In some directions, as notably in Osborne and Mendel's [11] feeding experiments with purified proteins and amino-acids, this generalization has been strikingly confirmed; but, as animal bodies are not homogeneous structures but consist of several highly differentiated

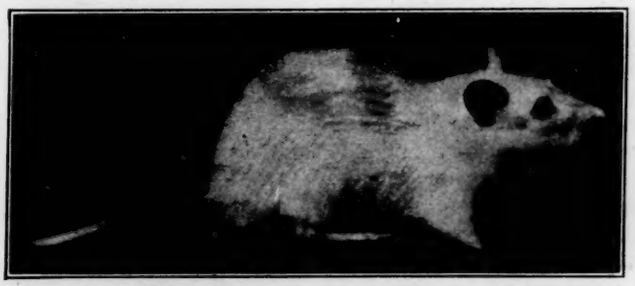

Fig. 3.—The condition shown in figures 1 and 2 was healed and normal growth resumed when the animal was given vitamin G in the form of a skimmed milk powder such as the federal services are using as an economical antipellagric food in the South.

anatomic systems, it is obviously not to be assumed that Liebig's simple view will continue to express adequately the results of modern research into the rates and modes of development of all the differentiated tissues which the growing body contains. And as a matter of actual experiment it now seems to be established that while muscles grow only to the extent that they are able to maintain the normal amino-acid content of their kind, bones may grow in size while remaining relatively watery and calcium-poor; and this, when it happens, necessarily results in a calcium-poor condition of the body as a whole—a calcium content such as would be fully normal only for a younger individual of the species. This condition is apt to persist unduly whenever the food does not contain the high calcium content needed for the rapid calcification (ossification) of optimal development, and it must be regarded as retarding the progress of the body from the condition of infancy to that of adulthood. And as emphasized by the recent analyses of Booher,[10] this retardation of the chemical development of the body may coexist for a long time with normal gains in height and weight and excellence of physical appearance and so may continue to escape attention even when the child is systematically weighed, measured and examined, for, obviously, the

10. Booher, L. E.: Dissertation, Columbia University, 1928. Sherman, H. C., and Booher, L. E.: Proc. Soc. Exper. Biol. & Med. **28**: 91 (Oct.) 1930; J. Biol. Chem. **93**: 93 (Sept.) 1931.

11. Osborne, T. B., and Mendel, L. B.: J. Biol. Chem. **12**: 473, **13**: 233, 1911; **15**: 311, 1913, and subsequent papers.

physician's examination of the child is essentially a physical rather than a chemical examination; chemical analysis of the body or bones, sufficiently complete and controlled to be conclusive, is feasible (with perhaps a few rare exceptions) only in work with experimental animals. But our children should get the benefit of our animal experimentation.

Very recently, then, the results of such experimentation have been brought to a point at which we may definitely conclude that, while in many respects the growing body does very closely "obey" Liebig's law, yet it may grow up calcium-poor because of calcium-poor food, or iron-poor because of iron-poor food. The iron-poor condition will usually be detected through some observable tendency toward anemia, while the calcium-poor condition is more likely to go undetected and may (probably often does) persist throughout growth and into adult life. Naturally, a liberal intake of phosphorus also is needed, for the calcium is laid down in the body chiefly as calcium phosphate.

If it be asked just what penalty ensues from such a calcium-poor condition of the body, the answer is not altogether clear cut: the condition described probably plays a part in a number of weaknesses and increased susceptibilities to infection without being exclusively responsible for any one of them. The interrelationships of nutritional factors will have the effect, on the one hand, of a divided responsibility for many suboptimal conditions, so that these while really nutritional cannot readily be proved to be so. On the other hand, however, it makes possible the attainment of highly significant improvements in the general condition of nutrition through the joint effects of the interrelated factors.

Fig. 4.—As contrasted with the alertness, vigor and good muscular tone of the animal shown cured in figure 3, there is here shown an animal of about the same age, whose food while not entirely lacking in vitamin G has been poor in this factor. The thinness of hair is indicative of an incipient dermatitis, and the general appearance and attitude of weakness with combined torpidity and apprehensiveness are a frequent result of this type of ill balanced diet and are more or less suggestive of the depression which some physicians consider a characteristic feature of the pellagra syndrome. (Reproduced by courtesy of the Journal of Nutrition.)

IMPROVEMENT IN HEALTH AND LONGEVITY THROUGH BETTER DIETARY

True, it has usually seemed simpler and more orderly to study the factors concerned in nutrition one by one; but it would be a mistake to suppose that this is the only scientific method, for science has not yet reached a point at which it may safely be assumed that the sum of the known parts is equal to the whole; and, even if one were sure that all the parts were known, there is an important principle, scientific as well as philosophical, that a whole may be a sort of synthesis which is something more than a mere summation of its parts. For example, early in their epoch-making feeding experiments with isolated food substances, Osborne and Mendel [12] emphasized strongly and clearly the nutritional superiority of their "natural protein-free milk" over any "artificial protein-free milk" that they could prepare even in the light of their unprecedentedly thorough investigation of the substances involved. In the two decades of active research since their publication of this fundamental finding, its general purport has been repeatedly confirmed, and even the discovery of half a dozen vitamins concerned in mammalian nutrition still does not enable one to account completely for the nutritional value of milk or of protein-free milk.

Are there other vitamins essential to human nutrition still to be discovered, at least in the sense of differentiating into two or more substances what is now called vitamin G; or is milk one of those "wholes" which, while chemically a mixture, is in the philosophical sense a sort of synthesis whose significance is greater than that of a mere summation of its parts? Very probably, both; that is, very probably there are here involved both substances and interrelationships whose nutritional significances are even greater than is yet fully appreciated.

The view that the evolution of mammals has produced, for them, an especially significant nutritional "whole" in milk does not imply the desirability of any long period of exclusive milk diet: in fact, our present knowledge rather warns us against such exclusiveness. It does imply that by a larger use of milk in ordinary mixed diet we may be able to bring about a better-than-average nutritional condition. And this may be true—though in view of their place in nature, probably to a less extent—of the other "protective foods" as well.

Hence from the point of view of today, we need not stop with the finding of what provides adequately for each known nutritional factor but may proceed to explore the zone which lies between the merely adequate and the optimal in nutrition.

To the extent that food can make the difference between a merely average and a better-than-average nutritional condition, it may also function as a more potent resource in the physician's armamentarium than has yet been generally appreciated.

In general, however, we should not look for quick results from improvements in human nutrition. One of the most impressive features in recent discoveries regarding the relations of food to health and vitality is that the benefit of better feeding usually becomes fully apparent only when it is continued throughout a large part of the life-cycle, and often the benefit is greater to the second generation than to the first. While this may seem slow from the standpoint of therapeutics, it would also seem to indicate that the effects of food on vitality may be fundamental and far-reaching.

Through simply a wiser emphasis in the daily choice and use of ordinary staple foods there may result improvements in the vitality of the individual or the family, all well within the bounds of normal nutrition but of very real significance for the maintenance of health or for recovery from disease.

Here again we turn to the evidence derived from experimentation on laboratory animals, partly because this permits of controlled conditions and partly because we can experiment thus with the influence of food on the health of an entire lifetime and even of successive generations.

We have families of rats which are thriving in the twenty-seventh generation on uniform diet—certainly a

12. Osborne, T. B., and Mendel, L. B.: Publication 156, Carnegie Institution of Washington, 1911; J. Biol. Chem. **15**: 311, 1913; **31**: 149, 1917.

sufficiently rigorous demonstration that the diet is entirely adequate. Yet on enriching this already adequate diet in certain of its chemical factors by increasing the proportion of milk in the food mixture, there results an improvement in the general nutritional condition as shown by a whole series of criteria, such as more rapid and efficient growth, lower death rates and higher vitality at all ages, an increase of 10 per cent in the average longevity of adults, and greater extension of the prime of life, in that maturity is expedited and senility deferred in the same individual.

As there has been so strong a tendency to attribute longevity entirely to hereditary factors, it may be worth while to emphasize the fact that here in parallel groups of exactly the same heredity the influence of food on longevity is demonstrated with such degree of mathematical certainty as is represented by "chances" much better than 10,000:1, or with a hundredfold greater certainty than is usually considered necessary for the conclusive establishment of such scientific observations.

My associates and I are now engaged in working out the rôle of individual chemical factors in this improvement of an already normal nutritional condition. Increased calcium intake and increased intake of vitamin G (and perhaps other factors which accompany it in the water-soluble part of milk) have so far been found to have contributed to the improvement in health and longevity just described. Experiments to determine the influence, if any, of increasing the intake of still other chemical factors in an already adequate diet and to elucidate further the interrelations between these factors in their functioning for the betterment of an already normal nutritional condition are still in progress.

Fig. 5.—"Premature senility and falling of hair," resulting from continued use of food poor in vitamin G though by no means devoid of it. This photograph was taken when the rat was 8 months of age, corresponding to about the third decade in man. This was an exceptionally well marked case. (Reproduced by courtesy of the Journal of Nutrition.)

ABSTRACT OF DISCUSSION

PROF. GEORGE R. COWGILL, New Haven, Conn.: Those familiar with both pellagra and beriberi are aware of the similarities which these two diseases frequently show in their respective syndromes. Numerous papers have appeared which emphasize this fact. It has been shown by Karr, Cowgill and others that the antineuritic vitamin plays a remarkable rôle in maintenance of the normal urge to eat. More recently, Cowgill, Rosenberg and Rogoff, working in the Yale laboratory, have found that administration of large amounts of water to dogs, sufficient to bring about marked diuresis, results in loss of appetite for the experimental ration in a much shorter time than when water is allowed ad libitum. It is not at all unlikely that the diarrhea so characteristic of pellagra means a definite loss of much of the antineuritic vitamin as well as pellagra-preventive factor ingested by the patient, and the symptoms suggestive of beriberi are thus brought about superimposed on a pellagra syndrome. With respect to the treatment of this condition, it is gratifying to know that the biochemists have had considerable success in preparing concentrates of the antineuritic factor suitable for parenteral administration.

DR. A. A. HEROLD, Shreveport, La.: When Dr. Goldberg was making his investigations, he toured through Louisiana. I accompanied him on part of that trip, making a number of observations in 1915, I believe it was, and at that time we were looking for something specific. We knew nothing of vitamin G, such as brought out here today. It had already been brought out by investigative work by Dyer, Bass and others of Louisiana that the deficiency of blood calcium in pellagra and lowering of the coagulability of the blood were important and that fresh foods were valuable. We had a great many patients that could not eat fresh foods; in fact, we had patients at that time, and we still see some today, who could not eat anything because their mouths were so sore. The stomatitis is so marked in such patients that there is a constant dribbling of saliva. When they get food in their mouth they cannot swallow. At that time it occurred to me that what they needed was something fresh, something with high protein content, something that would increase the coagulability of the blood. Grasping in the dark, as it were, I tried empirically normal horse serum administered intravenously and supplemented by lime salts, both intravenously and by mouth, when the patient was able to swallow. The results were so gratifying in many cases that I continued it and I still use it in my severe cases, not for a curative effect, but it seems to have a specific effect in alleviating the most troublesome symptoms, namely, those of the gastro-intestinal tract. Following the publication of my work, which was read before the Louisiana State Medical Society, others have reported to me gratifying results from normal horse serum with calcium, enabling them later to institute other measures after having tided the patients over. Whether or not normal horse serum as prepared by the biological houses contains vitamin G, I do not know, but if it does, that may explain at least in part the value of the treatment.

DR. RUSSELL M. WILDER, Chicago: I should like to mention two cases of pellagra that developed in patients that were under a dietary treatment for epilepsy. This regimen is one in which carbohydrate is restricted to the point of provoking a persistent ketosis. Its advantage in epilepsy has been the subject of a number of reports. Its possible harmfulness is illustrated by the cases mentioned. The intake of carbohydrate is reduced to as little as 10 or 15 Gm. a day and with such a small allowance of this food factor the practical difficulty of incorporating an adequacy of the water-soluble vitamins is considerable. Vitamin C is provided in orange juice; vitamin B carriers are noticeably lacking. In the two cases referred to, the developing dermatitis of the backs of the hands had the appearance of the characteristic skin lesion of pellagra and in both cases the addition of brewers' yeast alone, without other alteration of the diet, promptly resulted in a cure. Since then I have made a practice of including yeast in all my epileptic diets and thus far have not again encountered this complication. Also calcium is necessarily deficient in these ketogenic diets by the nature of the reductions which they impose and so calcium lactate is given in a dosage of from 2 to 3 Gm. a day. The moral of this I have already mentioned in my chairman's address, namely, that however little the danger of vitamin inadequacy when people are permitted to eat according to the dictates of their appetites, restricting diets for therapeutic purposes carries with it the danger of provoking deficiency diseases and this must be guarded against by thoughtful planning. Another deduction from the experience cited is that pellagra-like lesions will develop from vitamin B deficiency alone when all the other food factors of the diet are adequate.

DR. H. C. SHERMAN, New York: Dr. Wilder raised the question of the possibility of frequent occurrence of what I think he called incipient cases of vitamin deficiency. I shall not attempt to discuss that as a clinical question; it would be

out of my sphere. It might be of interest to note what the laboratory experimentation on animals that can be kept under dietary control throughout the whole life cycle, and when desirable through successive generations, indicates on that point. It indicates clearly that with respect to vitamins A, C and G the optimal intake is far above the amount which can be definitely proved to be necessary, as judged by the development of the symptoms. That is, to enable the individual and its offspring to do the best requires far more of vitamin A, C and G than the amount that is required to prevent the appearance of any of the typical symptoms of the deficiency disease. The recent work on the relation of vitamin C to teeth shows that, for the complete protection of the teeth, twice as much vitamin C is required as for the prevention of the longer known symptoms of scurvy. The work of Mellanby and Green shows that to get the full anti-infective effect, whatever that may be, of vitamin A, requires about four times as much vitamin A as is required to prevent the characteristic symptoms of vitamin A deficiency. In our own laboratory, experiments just completed and not yet published indicate that at least twice as much vitamin G gives improved condition in nutrition as the amount required to prevent the signs of vitamin G deficiency; so that, with respect to all three of those vitamins, the laboratory evidence is in the direction of an affirmative answer to the clinical question which Dr. Wilder raises. Whether it should be called latent vitamin deficiency or not, there are undoubtedly a great many persons not showing the characteristic signs of vitamin deficiency but who would do better if they got more of one or another of those three vitamins.

MANAGEMENT OF SKULL FRACTURES AND INTRACRANIAL INJURIES*

HARRY E. MOCK, M.D.
CHICAGO

The subject of skull fractures and intracranial injuries is filled with so many ramifications that one cannot cover all its intricacies in a single paper. Many of its problems are still subject to controversy. One can only hope to clarify a few of these controversies and leave with the reader a few high lights in the management of skull fractures which experience has shown to be useful.

I have reviewed practically every article written on skull fractures since 1900. These articles review 20,000 cases of skull fractures, but for statistical study I could use only 8,649 of the reported cases.

This study has developed the lack of uniformity in classifying skull fractures, in classifying the associated cerebral injuries, in the mortality statistics and in working up clinical and roentgenographic observations that justify the diagnosis of skull fracture. Too often the statistics are based on the individual's interpretation of his cases, which may differ widely from another individual's classification. This leads to such widely divergent opinions as expressed in the following figures: Cushing, in 1909 reported that 80 per cent of all patients with basal skull fractures died. Frazier, in 1909, reported a 59 per cent death rate in all basal skull fractures. Rawlings, an English author, in 1904 gave 32 per cent as the approximate death rate in basal skull fractures.

The review of the literature does show, however, that in each decade the authors refer to their lines of treatment as conservative; that in the first decade of this century there were fewer operations than in the second decade (50 per cent fewer); that in the second decade, when decompression operations per se were the vogue, the gross death rate was the highest; that in the third decade, or from 1920 to 1928, decompression operations per se were becoming less frequent and the gross death rate was 17 per cent less; that far fewer operations were being performed from 1926 to 1928 with a gross death rate of 25.8 per cent in 2,085 cases, as against a death rate of 49.7 per cent in 2,850 cases from 1910 to 1920. In the second decade, out of 1,850 patients in which treatment was discussed 24.2 per cent were operated on, while in the three-year period 1926, 1927 and 1928, 10.8 per cent of the 1,995 patients were operated on.

No one can review this literature without being convinced that:

1. Far too many skull fractures have been operated on in the past.

2. There is gradually developing in this country a far more common sense, rational management of skull fractures than we have ever had before.

Yet in studying the current literature and in talking with many surgeons in various parts of the country it is evident that many still believe in and are doing decompressions to relieve intracranial pressure. It is apparent that far from a unanimity of opinion exists concerning the management of skull fractures.

In the December, 1930, issue of the *International Journal of Medicine and Surgery* are four articles on skull fractures. Adson [1] says:

> Conservative treatment is advisable. Obviously, lacerated scalps and depressed fractures need surgical attention, and the surgeon must elect the time most suitable for such procedure. In some cases, the injury is so extensive and the shock so profound that death is inevitable, and any attempt at surgical repair is unwarranted. In other cases it is apparent that hemorrhage is in progress and that immediate exploration is necessary, even though there is no evidence of recovery from shock. In most injuries of the head without depressed fracture, the nonoperative, dehydration procedure appears to offer the best results.

Loyal Davis [2] says:

> We feel that subtemporal decompressions are never indicated in patients in coma from a skull injury. Bilateral subtemporal decompressions are mentioned only to be condemned as being doubly worse. To obtain a decompression effect it is of course obviously necessary to open the dura mater. Regardless of how gently or carefully any cranial operation is done, in which the brain is exposed, edema results. This is added insult to injury. To insert a drain into the cranial cavity only opens an avenue of infection to the subarachnoid space which may prove fatal. In complete accord with Rand and others we have found one sign, however, which is pathognomonic and upon which considerable reliance may be placed. I refer to a dilatation of the pupil upon the side of the hemorrhage. This sign, in the absence of any other corroborative evidence, is a sufficient indication for surgical interference and points rather directly to the side of the lesion.

A. A. Jackson [3] of Florence, Ala., says:

> There are several cardinal signs of increased intracranial pressure which call for a decompression operation, and which might be enumerated as follows: Slowing of the pulse rate, retinal edema and change in the visual field, increase of pressure of cerebrospinal fluid; as shown by the mercurial manometer at lumbar puncture, and increased arterial tension. For the average practitioner a change in the pulse rate is perhaps the most dependable sign. Of course, if there is a depressed fracture of the vault, this should be elevated and removed or an accurate coaptation of fragments established. If the signs

* Read before the Tacoma Surgical Club at a meeting for the surgeons of Oregon, Washington and British Columbia, April 18, 1931.

* Owing to lack of space, this article is abbreviated in THE JOURNAL by omission of the illustrations. The complete article appears in the author's reprints.

1 Adson, A. W.: Internat. J. Med. & Surg. **43**: 617 (Dec.) 1930.
2. Davis, Loyal: Internat. J. Med. & Surg. **43**: 621 (Dec.) 1930.
3. Jackson, A. A.: Internat. J. Med. & Surg. **43**: 629 (Dec.) 1930.

of intracranial pressure do not appear, the medical plan of treatment should prevail. The operation of cranial decompression and drainage upon this group of patients, forming, in our experience, two thirds of the patients injured, is not only not justified, but is not indicated. [Infers that one third need operations.—Author.]

J. D. Wharton [4] of El Dorado, Ark., says:

A large number of our cases are fractures of the skull. We operate upon most of them as we find it necessary to save the patient's life and to give them a much greater opportunity for

TABLE 1.—*Skull Fractures Since 1900*

			Operative Data					
			A. No Data; Number of Cases	B. No. of Cases with Data on Operation	Operations: Cases Under B Only		Operative Mortality, per Cent	
Years	Total Number of Cases	Gross Mortality, per Cent			Number	Per Cent		Comment
1900-1910	1,700	46.6	922	778	93	12.0	59.0	About 50% were basal skull fractures
1910-1920	2,850	49.7	1,000	1,850	449	24.2	45.6	Many patients were operated on for decompression only
1920-1928	4,099	33.4	90	4,009	587	16.0	46.6	Tendency for more definite reasons for operation
1926-1928	2,085	25.8	90	1,995	216	10.8	50.0	Most of these cases classified as "cranio-cerebral injury"
Author's cases	100	20.0	0	100	13	13.0	37.6	

complete recovery. In numerous fractures of the skull, we elevate the depressed portions of the skull if such is the case, and then we do a trephine through the line of the fracture of sufficient size to drain the hemorrhage from around the skull, relieve the pressure and our patient usually goes on through a complete recovery without any further trouble. If you are in doubt as to whether it is necessary to operate watch your patient for a few hours and if the pulse grows weak you may know that an immediate operation is necessary to save his life.

No four articles could better illustrate the need of clearing up the controversies concerning the management of skull fractures.

Equally, if not to a greater extent, controversy has been waged over the question of lumbar puncture. I have heard Dandy declare on two occasions that lumbar puncture has no place in the treatment of skull fractures, and on a third occasion he admitted that he did do lumbar punctures in subarachnoidal hemorrhage—that unless blood was in the spinal fluid the puncture was not indicated.

Loyal Davis five years ago was lukewarm concerning the use of lumbar puncture in skull fractures. He states now that his opposition was directed against the practice of routine lumbar punctures. In the article previously quoted, Dr. Davis says:

> It must not be supposed that we feel that spinal punctures should never be performed in the treatment of skull injuries. Like all other therapeutic procedures, we feel that it has its definite indications. This is particularly true in that group of skull injuries which are accompanied by large amounts of blood in the subarachnoidal spaces. . . . In such cases spinal punctures which empty the blood from the subarachnoidal spaces do more to quiet the patients than any other procedure.

Cushing has opposed spinal punctures. Yet Bailey, head of the department of neurosurgery at the University of Chicago, for years his assistant, frequently resorts to spinal punctures in skull fractures. Sachs has told me definitely that in his opinion spinal punctures should not be used and have no value in skull fractures. Pete of Ann Arbor, Mich., says that routine lumbar punctures are indicated in skull fractures. Harry Jackson advocated routine lumbar punctures in his original article.

In my opinion, both those who say that seldom or never should lumbar punctures be used and those who say they should be used as a routine are wrong. There is a middle ground, however: There are cases in which this procedure is definitely indicated and of the greatest value, but it should be used only in those cases.

The accompanying tables were developed from a study of 100 cases of skull fractures treated by me—a study which consisted in going back over the histories of these cases and ascertaining how and why they were treated as they were. From this study I was able to develop four groups of cases according to the symptoms and the line of treatment followed.

All the patients in group 1 (table 2) had extensive fractures in the vault, yet it was difficult to persuade them that they had skull fractures and to make them submit to the minimum treatment of three weeks' rest in bed. Certainly in such a group neither lumbar punctures nor decompressions would ever be considered (fig. 1).

It will be noted from table 3 and subsequent tables that the fracture in the bony skull plays little part in the development of the management of the case. The various steps in the management of these cases depends almost entirely on the damage done to the contents of the skull.

The symptoms as classified in group 2 (table 3) are typical of the majority of cases of skull fracture, differing only in the degree of severity. It is on this fact that the choice of treatment between purely routine methods and the procedure of lumbar puncture is based. One must observe these cases closely and constantly, especially as to the pulse, respiration and blood pressure. The pulse and respiration can slow very rapidly and just as quickly change into the rapid pulse and rapid, shallow breathing indicative of a medullary compression. When the latter condition has developed, lumbar puncture or any other line of treatment too often fails to save the patient. This procedure of lumbar puncture should not be postponed too long therefore, but, likewise, it should not be done unless close observation of the patient shows its need.

TABLE 2.—*Group 1: Rest Treatment Only*

4 PER CENT
Evidence of skull fracture by roentgen examination only Practically no signs nor symptoms
Treatment
Rest in bed for three weeks' close observation.

In table 3 appears the question Morphine—when? One should remember that morphine is a respiratory depressant. Many times I have seen the symptoms in skull fracture so disguised by the use of morphine that one cannot be logical concerning the further treatment of the case. In cases of extreme delirium and great shock on admission, one may be justified in administering morphine rather than see such a patient thrash himself to death, but it is seldom indicated.

Whenever a serious accident occurs but results in an apparently trivial head injury, that head injury should be considered serious until proved otherwise. By considering the head injury as serious implies the taking

4. Wharton, J. D.: Internat. J. Med. & Surg. **43**: 633 (Dec.) 1930.

of a roentgenogram; but it further implies that if the roentgenogram is negative the patient must be placed at complete rest in bed under close observation.

But there is a time and place for all things and this is especially true in relation to head injuries and the x-rays. Given a serious head injury with the patient in deep shock, in coma or more often delirious and thrashing about, one does not need a roentgenogram to diagnose a definite cerebral injury. In fact, the roentgenogram will not show the damage to the brain. It may show a depressed skull fracture but most often only a linear fracture. A roentgenogram should not be taken in such a case until the shock has been overcome and the condition of the patient is such that the added insult of moving to an x-ray laboratory and of the turning over and over, necessary for taking of the several views of the skull, will not endanger his recovery. If need for a roentgenogram seems very definite, one should resort to a portable x-ray machine; but even here it should be delayed until the shock is over and the condition of the patient will tolerate it. When the roentgenogram is thus delayed or one has been taken with

TABLE 3.—*Group 2: Routine Treatment*

50 PER CENT
Signs and Symptoms
1. Disturbed consciousness.
2. Slowed pulse—not below 55 and not persistent.
3. Slowed respirations—not below 17 and not persistent.
4. Lowered blood pressure—not persistent after shock is relieved.
5. Blood or cerebrospinal fluid from ears or nose.
6. Roentgen evidence.
7. Pupillary changes; changed reflexes; Babinski sign.
8. Observe closely for focal signs.
Routine Treatment
1. Rest in bed from three to eight weeks.
2. Morphine—when?
3. Combat shock.
4. Combat increased intracranial pressure:
(*a*) Magnesium sulphate.
(*b*) Hypertonic solution intravenously; dextrose solution.
5. Prevent dehydration.
6. Prevent starvation.
7. Local treatment:
(*a*) Scalp wounds; compound fractures.
(*b*) Discharging ears or through sinuses.
(*c*) Of swollen eyes.
(*d*) Associated injuries.

a portable x-ray machine, one should eventually have a roentgenogram made in the x-ray department, as no case of skull fracture should go unproved and the portable x-ray machines are often inadequate. A scientific, not too commercial, x-ray department will check all roentgenograms taken with portable apparatus for the sake of accuracy. In a monograph, Stewart and Tuchett have recently described in detail the technic and demonstrated that basilar fractures can be shown on a roentgenogram in the majority of cases. Tuchett comments in the surgical preface: "The numerous results positive for fracture in very mild cases warrant the rule that every skull receiving violence ever so slight, imparted directly or indirectly, with or without accompanying symptoms of intracranial pressure, should be considered possibly fractured until conclusively proven otherwise." He recommends in every case two lateral, one frontal and one occipital exposure, and if one has perfected the technic, one of the base also. Others have recommended stereo views especially, claiming that they bring out fractures that do not show on the flat plate.

A careful neurologic examination is always indicated in these head injuries, and the earlier it can be made the better index one has of the actual brain injury. However, the same restrictions must be made here as in the roentgen examination. No undue disturbance of the patient for this or any other examination must be tolerated until the severe initial shock has been properly treated and overcome.

A fixed, dilated pupil usually indicates a brain lesion and hemorrhage on the same side of the cortex. I have witnessed this phenomena many times even in patients whose symptoms clear up without lumbar puncture. It should never, as some authors have stated, be the sole indication for operative intervention. The equally contracted, fixed pupils are suggestive always of basilar injury and hemorrhage. This condition, while extremely serious, does not necessarily mean a fatal prognosis. Eyeground examinations should always be made in cases of skull injury as soon as the general condition of the patient warrants. A slight cloudiness of the edges of the disk, a beginning papilledema, must be watched for and when found is not necessarily an indication for operation but certainly warrants recourse to lumbar puncture. As a rule a definite choked disk comes with the symptoms of complete medullary compression when operative treatment is usually futile.

Changes in the reflexes and Babinski or Oppenheim signs are suggestive of pyramidal injuries. Often these are only temporary. When persistent, they may be the only focal signs presented in a subdural hemorrhage. When a patient does not yield or yields only temporarily to routine treatment and lumbar punctures, and has these signs persistently present, one must then consider the need of operative intervention. Correct interpretation of these focal signs should lead to the proper site of opening the skull. Fortunately, but few cases fall in this rather unsatisfactory classification for operative intervention.

Definite paresis or paralysis of one or more extremities, convulsions or twitchings form the usual focal signs that point to an extradural or subdural hemorrhage and are definite indications for operation. Depending on the side of these focal signs, the site for operation is usually indicated; viz, the opposite side of the skull. However, if one fails to find the lesion on opening the indicated side of the skull, one should not hesitate to open the opposite side, as contrecoup injury to the brain not infrequently happens. In one case I opened the skull over the right rolandic area as the site of fracture over the right parietal region and the paralysis of the left arm and leg definitely indicated. No hemorrhage was found. The patient died in eight hours and at autopsy a large extradural clot was discovered over the left hemisphere of the cortex. This condition is rarely reported, but every surgeon should be on his guard for it (fig. 2).

In group 2, 50 per cent of the cases recovered under routine treatment only. Reference to table 3 gives an outline of procedures included under routine treatment, but certain of these need further explanation.

The great majority of injuries of the head give a very pronounced picture of shock. This is characterized by cold, clammy skin, weak, thready pulse, shallow and often increased respirations, low blood pressure and subnormal temperature. Disturbed consciousness of varying degrees accompanies this abnormal state. This picture of shock is quite similar to the very dangerous condition of medullary compression. It must at times be differentiated in order that this condition can be combated early. The rise in temperature with a patient apparently in shock is the best guide available in a case of medullary compression developing almost immediately on admission. Such a case usually has a fatal termination but should have the benefit of lumbar drainage at least, even while the

shock is being combated. Operative intervention in such a case is futile, as this type will not stand the added insult of decompression.

Intelligent care of shock is the first and sole duty of the surgeon in the initial treatment of skull fractures.

It has been said that 15 per cent of all skull fractures invariably terminate fatally and most of these usually within the first few hours. Without question a high percentage of these patients die of shock rather than of the cerebral injury per se. Adequate provisions for combating shock immediately after the injury, during the transportation of the patient to the hospital and on reaching the hospital would undoubtedly save many of these patients. This means that the public must be informed with regard to keeping the injured patient quiet and warm; that the ambulances should always be accompanied by a young physician who can start the treatment of shock during the transportation, and that the hospitals must have emergency receiving rooms equipped for the immediate relief of shock. Many physicians must be forced to recognize the greater importance of treating shock at once, postponing the too often malicious habit of handling the patient for examination, of roentgenographing him at once and even of rushing such a shock patient to the operating room.

Conserving the body heat by warm blankets, applying hot water bottles, giving of a shock enema of hot, strong coffee and, when indicated, the intravenous injection of 500 cc. of physiologic solution of sodium chloride or a hypodermoclysis of from 1,000 to 2,000 cc. of the same solution are the methods usually employed. Stimulants such as caffeine or ampules of camphor, N. F. may be necessary. No effort at dehydration should start until this initial treatment has relieved shock.

Dehydration methods are based on the fact that hypertonic solutions will withdraw fluids from the body tissues into the blood stream by a process of osmosis. In doing this the brain is likewise depleted, thus relieving the increasing edema which has followed the cerebral injury. This method is considered new, yet old writers on skull fractures advocated rest and purging of the patient as the sane line of treatment.

Four ounces of a 50 per cent solution of magnesium sulphate given slowly as a retention enema and repeated, if conditions indicate, every four to six hours of the first forty-eight hours, is the usual procedure. It can be given by mouth, but there is great danger of starting vomiting with its accompanying retching and strain on the patient. Dextrose is now the chief hypertonic solution used intravenously, although a 15 per cent salt solution has been used and is still advocated by some. Fifty cubic centimeters of a 50 per cent solution or 100 cc. of a 25 per cent solution of dextrose is given slowly, intravenously. It should be absolutely sterile and for this purpose the standard ampules diluted with triple distilled water are best used. This can be repeated every eight to twelve hours if the patient's condition is not improving. In many cases, however, one injection of dextrose and two or three enemas of magnesium sulphate are all that is necessary. If, after a few days, the patient begins to grow restless, the pulse is slowing and headaches are complained of, this treatment should again be instituted. The injection of dextrose may be given during the shock period, as it is an excellent stimulant.

Dehydration must not be carried to the danger point. As a rule the intake of fluid is likewise restricted during this period of treatment. After forty-eight hours it behooves one to push fluids and even to give physiologic solution of sodium chloride under the skin with a view of striking a balance and preventing undue dehydration. Close observation and common sense must govern the actions during this stage of treatment.

Starvation must likewise be prevented. Frequently these patients are unconscious for days or stuporous and refuse to eat. Feedings at regular intervals through the stomach tube are therefore indicated.

Absolute rest in bed for a minimum period of three weeks in mild cases and six weeks or longer in the more severe cases is one of the most important features in the treatment of head injuries. Most observers have stated that too early activity is prone to result in post-traumatic neuroses and persistent cerebral contusion syndromes. Many of the latter cases have come from the group of head injuries failing to show roentgen evidence of skull fracture, which have been called cerebral contusions or concussions and in which, at the end of one or two weeks, the patients have recovered sufficiently to be discharged by the surgeon. Activity soon results in headaches, dizziness, ringing in the ears, phobias, melancholia and mental depression. These are the cases variously diagnosed as neuroses or malingering but which in reality are a definite admixture of organic and mental disturbances. Time may clear up the condition, but when this state develops the wise surgeon will place such a patient in the hospital at absolute rest and again start his dehydration and sometimes his lumbar puncture treatment.

Just a word of explanation of the seventh point in group 2. In scalp wounds in patients suffering from skull injuries there is no justification in the immediate suture of such wounds. The shock treatment is delayed if the examining physician in the emergency receiving room takes time to suture the lacerated scalp. Yet from time immemorial it seems that the intern has looked on scalp wounds as his special field. I did in my intern days. It has required years of patient teaching to overcome this tendency of suturing the scalp wound in severe head injury cases, and it has not been completely overcome as yet. Too often these scalp wounds conceal compound fractures. Too often these scalp wounds become infected. The combination of compound fracture and infected scalp wound is extremely dangerous. Such scalp wounds should be left open. They should be painted with iodine or packed with gauze soaked in surgical solution of chlorinated soda, a sterile dressing should be applied, and one should begin at once to combat shock if one has not already started to.

Compound fractures should be cleansed aseptically as soon as possible. Even here, however, the treatment of shock should not be sacrificed. One is tempted to take the patient with the severe compound fracture, with brain substance oozing from the dirty, severely lacerated scalp immediately to the operating room for débridement. It should not be done, for too often such patients die on the table. Rather they should be put to bed, shock combated and the wound cleaned and sterilized as thoroughly as possible at the bedside. Later, when the patient can stand it, necessary operative procedures may be instituted.

Discharging ears, compound fractures through sinuses, and similar injuries should be kept sterile. Such wounds should not be irrigated as more infection is washed in than washed out. A few drops of mild silver protein, 15 per cent solution, and a sterile plug of cotton lightly placed in the external auditory canal is sufficient. The subsequent care of such wounds should not be left to the nurse. Cotton should be

changed in the entrance of the ear with the same metriculous, aseptic care as is used for open compound fractures elsewhere. The swollen eye, of course, needs attention. It should be irrigated twice a day and a few drops of mild silver protein applied until such time as the patient can open the swollen lids and the normal physiologic cleansing of the eye resumes function.

Table 4 shows that 33 per cent of the cases did not respond solely to routine treatment. The state of disturbed consciousness persisted; the pulse and respiration persisted or would improve temporarily and then return; the blood pressure would begin to rise or would rise and then fall—all signs of persistent or a returning increased intracranial pressure. These patients were then subjected to the special treatment of lumbar puncture. Routine treatment was carried on just the same in this group, but added to it was this special procedure. The least sign of a beginning papilledema was considered sufficient indication and its persistence additional indication for puncture and repeating the puncture.

TABLE 4.—*Group 3: Special Treatment—Lumbar Puncture*

33 PER CENT
Signs and Symptoms
1. Persistently disturbed consciousness.
2. Persistently slow pulse and respiration.
3. Marked changes in blood pressure.
4. Signs of persistent or of returning increased intracranial pressure.
5. Appearance of papilledema.
6. Signs of meningitis or meningeal irritation.
7. Occasionally for diagnosis.
Routine Treatment Plus Lumbar Puncture
1. With persistent or increasing delirium or coma; repeat.
2. With return of slow pulse and respiration; repeat.
3. All but two cases had blood spinal fluids on first puncture.
4. Number of punctures:
1 patient, 15 spinal punctures.
1 patient, 5 spinal punctures.
4 patients, 3 spinal punctures.
18 patients, 2 spinal punctures.
8 patients, 1 spinal puncture.
1 patient, 1 diagnosis spinal puncture.

Meningeal irritation or a condition of meningismus is prone to develop when the spinal fluid shows the continued presence of blood over a period of forty-eight hours or longer. It is often hard to differentiate from a true meningitis. Both conditions warrant lumbar puncture, and if true meningitis develops, repeated punctures, even cisternal or ventricular punctures, offer the best chance in an extremely dangerous condition.

Rarely is a lumbar puncture necessary for diagnosis in skull fractures. It is at times indicated in those patients found unconscious on the streets, with no history of injury and very little evidence of trauma, when a differential diagnosis as to the cause of the coma is needed.

Thirteen per cent of the cases fell in group 4; namely, those which had some definite indication for operation. I know now that at least two of the patients who were given subtemporal decompressions, one within an hour and the other within twenty-four hours following admission, did not have definite indications for operation. Routine treatment and possible lumbar puncture offered far more chance for saving the lives of these two patients than did my operative intervention. They would not be operated on in the light of present experience.

In the one case of death following operation for depressed skull fracture the patient would undoubtedly have died anyway. But my operation, performed ten hours after the injury was received, did not add to his chance of recovery. One often says: "This patient is going to die if we don't operate, and the chances are that he will die if we do operate, but we will give him that one chance in a thousand." Within the first twelve hours following a skull fracture, in 99 per cent of cases such a premise is false. It is extremely rare that an operation during this period on a patient who is going to die, unless one operates, will save that patient. The possible exception is in a case definitely diagnosed as a middle meningeal hemorrhage, in which the main trunk of the artery is torn as it emerges on the inside of the skull and results in a rapidly growing extradural clot. Many surgeons have operated immediately on depressed skull fractures or have done very early decompressions and have found one of the branches of the midmeningeal artery bleeding or have discovered a slowly growing subdural clot and have had their patients recover; but these patients were not in a hopeless condition at the time of operation. The chances are that in every such case it will add greatly to the safety of the operative intervention if one will wait until the patient is over his shock and in better condition to stand operation.

In one of my cases of markedly depressed skull fracture the patient was practically moribund the first forty-eight hours. Shock treatment was followed by dehydration and lumbar punctures with bloody fluid obtained but with no improvement in his condition. Dr. George Hall, the neurologist, mentioned decompression but agreed with me that the patient could not possibly stand the operation. A hopeless prognosis was given to the family. The second twenty-four hours there was slight but very gradual improvement. The patient was still in deep coma, but improvement was noted in the pulse, respiration and blood pressure, which had been as low as 60 systolic. Toward the end of this period the patient's condition was sufficiently improved to warrant a roentgen examination with a portable apparatus. This showed a marked depressed skull fracture in the right parieto-occipital region. There had been no focal signs except sluggish reflexes and a persistent Babinski sign. Improvement continued under dehydration treatment, alternating with periods of pushing fluids and of feeding the patient by the stomach tube, and four lumbar punctures. On the sixth day I operated on the patient and removed the large depressed fragment, which was severely comminuted and could not be replaced. The patient made a complete recovery. He was kept in bed eight weeks and in the hospital ten weeks. On discharge he was kept from undue activity until sixteen weeks had elapsed. He returned to his job as railroad mechanic at the end of six months. Earlier roentgenograms would perhaps have tempted me to operate earlier. Early operation would have killed this

TABLE 5.—*Group 4: Special Treatment—Operations*

13 PER CENT
Signs and Symptoms
1. Definitely depressed skull fracture.
2. Signs of middle meningeal hemorrhage.
3. Subdural hemorrhages giving focal conditions:
(*a*) Paresis or paralysis in one or more extremities.
(*b*) Persistent or increasing choked disk.
4. With persistent signs and symptoms in spite of lumbar punctures.
Operations
1. For depressed skull fracture, 6.
(*a*) 1 death.
2. For middle meningeal hemorrhage, 3.
(*a*) 1 death.
3. For persistent symptoms, 1.
(*a*) no death.
4. For subdural hemorrhage, 1.
(*a*) no death.
5. Early decompression, 2.
(*a*) 2 deaths.

patient. Dr. Hall frequently refers to this case as one in which delayed operative intervention saved a life (fig. 3).

Extradural hemorrhages will give focal manifestations as well as subdural hemorrhages. Both may fail to give definite focal signs, such as paralysis, paresis or twitchings, or may give such signs which last for only a few moments. The patient or the nurse may remark about weakness being present in an arm at breakfast

TABLE 6.—*Mortality Rate*

20 PER CENT
1. Thirteen died within first twenty-four hours in the hospital.
(*a*) Seven within five hours.
(*b*) Two were operated on.
2. Remaining deaths:
(*a*) One, second day following operation.
(*b*) One, fourth day; fractures, vault base, diabetes.
(*c*) One, two weeks following operation, of midmeningeal hemorrhage.
(*d*) One, thirtieth day; coroner's report, pneumonia and skull fracture with bruising of brain.
(*e*) One, seventh day; increasing coma; basal skull fracture, no operation.
(*f*) One after thirty-six hours; decompression recommended but not done because of condition.
(*g*) One on fourth day; lobar pneumonia.

time, but when one examines the patient there is no sign of it. One must be alert to catch these temporary focal signs. Or, as in a case seen with Dr. Bailey at Billings Hospital, the patient may respond to lumbar punctures, but within a few hours may slip back into restlessness or slightly disturbed consciousness, slow pulse and respiration. The puncture is repeated; improvement occurs, to be followed by a return of the preceding picture. The most careful search fails to reveal focal signs except that the Babinski sign may persist and that a slight papilledema may be present.

This is the type of patient who has the persistent signs and symptoms referred to in group 4 and on whom operation is indicated. Usually in the absence of all other indications, it is wiser to open the skull at the site of the fracture. This was done in Bailey's case on the fifth day and he found a frontal subdural hemorrhage. In my case the fracture was in the right temporal region and on the fourth day of persistent signs and symptoms the skull was opened in this area. A definite bulging of the brain was noted but no hemorrhage. The dura was incised but no clot found. A small drain was left in the middle fossae and a decompression opening left in the skull. The patient recovered. This, of course, was a definite subtemporal decompression, but it was done for a definite indication and at the site of the fracture. I believe that there is the rare and occasional case in which such a subtemporal decompression is indicated, but I do not believe in this procedure when done for the sole purpose of relieving intracranial pressure during the first twenty-four to forty-eight hours. Simpler means of accomplishing relief of increased intracranial pressure have been proved.

Complications of skull fractures form an entire chapter. Late operations may have to be performed for some of these complications. Traumatic epilepsy is a rare complication. Patients with very slight depressed skull fractures have been submitted to operation on the premise of preventing traumatic epilepsy. Occasionally, however, one does see typical and atypical attacks of a jacksonian character which can sometimes be relieved by operation. Generalized epilepsy following skull fractures usually means that the epileptic background was present before the injury, and I have never seen it benefited by operation.

Localized traumatic encephalitis is more often an encysted subdural or cortical blood clot and can often be benefited by operation. Many subdural clots give symptoms the second or third week after the injury and are referred to as delayed hemorrhage. These usually give signs and symptoms indicative of needed operation. Rarely, brain abscesses develop in these cases. The condition is so rare that if a patient recovers from his skull fracture the surgeon need not hesitate to cry out against the attorney who tries to prolong fears in his patient's mind by holding up this bugaboo of brain abscess. This statement can likewise apply to traumatic epilepsy. The surgeon can usually predict in which cases these two possibilities are liable to occur and can positively rule them out in the great majority of his cases of skull fracture.

Adequate treatment, especially long periods of rest in bed and care not to neglect operative procedures in the few cases needing it, will prevent most of the cases of persistent cerebral contusions and the neuroses. No matter how adequate and well conducted the treatment, a certain number of these cases will develop neuroses as a result sometimes, of the surgeon repeating the remark, "Well, you are lucky to be alive and have your senses," or as a result of other seeds of phobia planted in the minds of the victims of skull fracture by physicians, the relatives, dear friends, or more often by an attorney who undertakes to recover damages for the injured.

The sequelae of deafness, blindness, ptosis, facial paralysis and other cranial nerve lesions and paralyses and paraplegias that occasionally follow in the wake of skull fractures require special treatment as a rule. Physical therapy, which, if persisted in, offers considerable hope for improvement, has been too much neglected by the majority of physicians in this class of cases.

Table 6, which shows the mortality rate in 100 cases, corresponds fairly well with the mortality statistics reported during the last five years. Most of these later

TABLE 7.—*Skull Fracture Problem*

Number of accidents, 1929	3,705,000
Public—chiefly automobile	1,085,000
Industrial	2,620,000
Number of accidental deaths	51,000
Public accident deaths	31,000
Industrial accident deaths	20,000
Number of accidental deaths in Chicago 5 months: December, 1929; January, March, June, July, 1930	1,649
Deaths due to craniocerebral injuries: number	586
Per cent	35.5
Number of accidents—capable—resulting in skull fracture	1,052
Deaths in this group due to craniocerebral injuries, per cent.	55.8
Total number of accidental deaths in U. S. (public, industrial or potential group)	51,000
Percentage of deaths due to skull fractures in potential group.	55.8
Approximate number of skull fracture deaths in U. S.	28,000
Average mortality in craniocerebral injuries, per cent.	25
Approximate number of skull fractures annually in U. S.	112,000

statistics, however, are based on craniocerebral injuries and many of .these are not proved skull fractures. Every one of these 100 cases are proved skull fractures either by roentgen examination or by the clinical picture, always accompanied by escape of blood or blood and cerebrospinal fluid from one of the ears. For each of these cases I could add two more cases of definite cerebral injury but with no definite proof of skull fracture.

Some authors in reporting mortality statistics rule out the patients dying in the first five hours in the hospital, which, in my series would leave a death rate of 13 per cent. Some authors include in their statistics

those patients who die in the ambulance on the way to the hospital. I have included in my series all patients alive on entering the hospital. In my second hundred series I have had five deaths in the first twenty patients admitted, all occurring within the first three hours in the hospital. Thus it is quite possible that when I report on 200 cases the death rate will be higher than given here. The 100 cases herein reported are the last 100 cases treated, going backward from 1930 until I had collected 100 cases directly under my own supervision and treatment. This took me back to about 1926 and will afford a standard for judging the treatment of my further cases.

Table 7 will give the reader a better understanding of the size of this skull fracture problem. These cases are scattered throughout the land and in the majority of instances must be treated by general men rather than by specialists.

CONCLUSIONS

1. The annually increasing morbidity and mortality rate due to trauma, with skull fracture causing a high percentage of the deaths, makes this one of the great economic and medical problems of our time.

2. It is impossible to standardize treatment, as each individual case presents its own peculiar requirements. But it is possible to give a rational routine treatment which can be applied to 50 per cent of all skull fracture cases and then to classify the remaining cases into the following three groups:

(*a*) Those in which rest treatment alone is sufficient (4 per cent).

(*b*) Those who must have, in addition to routine care, the special treatment of lumbar drainage (33 per cent).

(*c*) Those cases having definite, recognized indications for cerebrocranial operations (13 per cent).

3. In this article the effort has been made to clear up certain controversies by detailing those practices recognized by the majority of authors on this subject and proved of the greatest value in my hands, in the management of skull fractures and cerebrocranial injuries. The article is written for those men away from medical centers who are just as frequently confronted with these cases and who are sometimes led astray in their treatment by certain teachers decrying lumbar drainage and by other teachers extremely adept in operative technic, advocating operative intervention in skull fractures, especially decompressions.

4. If the average man will delay all roentgen examinations, undue physical examinations and operative procedures (with a rare exception) until the initial shock is over and then will classify his cases according to their signs and symptoms, he will develop for himself a common sense, rational line of treatment free from many of the controversial pitfalls commonly found in the management of skull fractures.

5. Skull fractures should be treated at or near where they occur. Specialists, if desired, should be taken to the patient with the skull fracture rather than the patient to the specialist. Since, in the majority of communities, specialists in this condition do not exist and since the automobile has become a potential carrier of skull fractures to every hamlet, village and city in the land, it behooves all with experience in this matter to simplify and clarify the management of skull fractures to the end that the majority of physicians can properly cope with this grave emergency when and wherever confronted with it.

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STUDIES OF DISEASES OF THE LYMPHOID AND MYELOID TISSUES

VI. THE TREATMENT OF MALIGNANT NEUTROPENIA WITH PENTOSE NUCLEOTIDES *

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In 1924 one of us [1] definitely demonstrated for the first time the existence in normal human blood of pentose nucleotides. In 1931 we [2] reported the case of a man with acute myeloblastic leukemia who, following the intravenous injection of pentose nucleotides, made a remarkable temporary recovery. Since that time we have been much interested in therapeutic possibilities of these complex and highly reactive substances, which normally circulate in considerable amount in the blood and are known to exist principally in the nuclei of living cells. Occasional reports [3] have been made indicating that nucleic acid or its decomposition products have a stimulating effect on the white blood cell formation. In the latest of these reports, Reznikoff [4] described four cases of agranulocytic angina treated with transfusions of blood and intravenous injections of the purine bases, adenine and guanine. Three of his patients recovered. It should be pointed out that Reznikoff used purine bases and not nucleotides as he himself noted in the next issue of the same journal.[5] Nucleic acid is a complex molecule made up of two pyrimidine and two purine nucleotides linked together. These nucleotides in turn are made up of a purine or a pyrimidine base together with pentose and phosphoric acid. These compounds may be further broken down to nucleosides with the loss of phosphoric acid and still further to the purine or pyrimidine bases with the loss of pentose. It is these purine bases that Reznikoff used—the unbroken nucleotide is used by us.

The nucleotides are readily soluble in water, essentially nonirritating and apparently stable in solution. We are not prepared to say yet whether the solutions retain their activity and their nonirritating qualities indefinitely.

The nucleotide was prepared at first by us and later by the Smith, Kline and French Company by the usual method of alkaline hydrolysis at room temperature, according to the technic of Jones and Perkins.[6] The solution, after hydrolysis is complete, is made acid with acetic acid and the crude nucleotide precipitated as the lead salt, which in turn is decomposed with hydrogen sulphide and the filtrate containing the purified nucleotide is evaporated under diminished pressure at a maxi-

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mum temperature of 50 C. to a small volume and neutralized with sodium hydroxide. From the resulting concentrated solution, sodium nucleotide is removed by absolute alcohol and dissolved in distilled water, and sufficient tricresol is added to make a 0.3 per cent solution. After it has stood in an icebox for two weeks the p_H is adjusted to 7.0 and the solution is run through a Berkefeld filter directly into small, sterile ampules. This preparation has been designated by ourselves and the manufacturers as "Nucleotide K 96."

Our purpose in the present paper is to bring forward our clinical results in the treatment with the unbroken pentose nucleotides (K 96) of twenty cases of profound leukopenia. No definite conclusions can be drawn as to the efficacy of the material until a much larger series of cases has been adequately treated. In cases of acute illness, 0.7 Gm. of "Nucleotide K 96" in 100 cc. of saline solution was injected intravenously, daily for four days. Seven-tenths gram in 10 cc. of distilled water was also given in addition intramuscularly on the same days and on each day subsequently until definite improvement had occurred. Following the intravenous injections, a sharp, temporary reaction sometimes occurs; to the intramuscular injections, as a rule, none.

To date the material has been given adequate trial in twenty cases.[7] Of the twenty cases, thirteen were typical agranulocytic angina; five patients had marked leukopenia and extreme lowering of the granulocytes in the presence of various infections, and two had extreme neutropenia and anemia secondary to benzene (benzol) poisoning.

Of the thirteen cases corresponding to those usually referred to as agranulocytic angina, eleven were in women between the ages of 34 and 71 years and two were in males aged 10 and 55 years, respectively. Seven of these thirteen patients (7, 8, 13, 14, 16, 18 and 19) recovered. In cases 7 and 19 relapses occurred after an interval of a few days, but they again responded favorably to treatment. In one more case (case 9) there was beneficial response in the sense that the patient's temperature and blood picture became normal exactly as they did in those who ultimately recovered, but this patient died suddenly of pulmonary hemorrhage a few days after her blood picture had become normal. Of the patients who recovered, four (7, 13, 16 and 18) had no polymorphonuclear cells whatever before treatment. Only one (patient 8) had a total granulocyte count on admission of over 150. All of the thirteen patients had mouth lesions, and in four (cases 8, 13, 14 and 16) there were very severe ulcerations. Patient 19 had vaginal ulcerations as well. In all but one the temperature was above 104 F. on admission or shortly after. In all of the patients who recovered, the first definite sign of clinical improvement occurred on the third or the fourth day after treatment was begun, irrespective of the duration of the disease before treatment. The first sign of improvement in the blood picture occurred almost invariably between the fourth and the seventh day—usually on the fifth day.

The consistency with which reaction occurred on or about the fifth day is of great importance. It is at this time that the reticulocyte rise begins to take place following the liver therapy in pernicious anemia and the iron therapy in certain types of hypochromic anemia. It is also at this time that the bone marrows of experimental animals subjected to a single injury begin to recover.

The total and differential white blood cell count was invariably normal ten days after treatment was begun, not infrequently in eight days. This was true also in the other classes of disease that were treated except benzene poisoning. General symptomatic improvement and the healing of ulcers occurred simultaneously with the hematologic improvement. In cases of recovery reported in the literature,[8] improvement almost always took place after a much longer interval and the temperature remained high for a much longer period. Two of our patients who were cured received blood transfusions (patients 13 and 16). In the former, the blood was given three days before nucleotide therapy was started and was followed by a drop in the white blood cell count. In the second case it was given after the white blood cell count had risen and it again was followed by a fall in white cells—the only instance of a real secondary fall after the initial rise, presumably due to nucleotide, had started. The charts of the temperatures and the blood cell counts are practically identical in all the cases—not only of the agranulocytic angina cases but also of the patients with malignant neutropenia associated with infection. It is on this point that we would lay most stress.

In five of the cases of agranulocytic angina there was no response whatever, either hematologically or clinically. No essential clinical difference appeared to exist between the two groups. In two of these fatal cases, repeated transfusions of blood were given, and one yielded a blood culture positive for streptococci. Three patients with agranulocytic angina have been admitted moribund and treated from twelve to thirty-six hours before death. These cases are not included in this report, as adequate treatment was not possible.

Five cases of malignant neutropenia, associated with overwhelming infection, were treated; all the patients recovered. In case 3 there was a huge abscess under the trapezius muscle with slough, which failed to respond to surgical treatment. The patient's initial white blood cell count was 750 per cubic millimeter, and his total polymorphonuclear count 150. Patients 4 and 5 were female infants whose initial white blood cell counts were 3,000 and 500 per cubic millimeter, respectively. Both had bronchopneumonia and otitis media. Patient 12 was a physician with pansinusitis whose total white blood cell count was 800 per cubic millimeter, and the total polymorphonuclear cell count 80. The patient was delirious and apparently moribund on entrance. Patient 20 had a stubborn osteomyelitis and a white blood cell count of 1,700 per cubic millimeter with no polymorphonuclear cells. In these five cases again the temperature came down to normal on the fifth and sixth days after treatment was begun, irrespective of the duration of the disease, and the blood picture showed definite improvement on the same day.

Two patients with chronic benzene poisoning were treated. Both men were extremely sick on entrance. Both had a high fever and a marked anemia. The white blood cell counts numbered 1,000 and 2,000, respectively. Patient 1 was given a blood transfusion shortly after entrance, but without benefit. His white

7. The various physicians under whose care these patients were treated, and particularly Dr. Francis T. Hunter of the Massachusetts General Hospital, gave hearty cooperation. Without their aid the work would not have been possible.

8. Harkins, H. N.: Granulocytopenia and Agranulocytic Angina with Recovery, Arch. Int. Med. **47**: 408 (March) 1931. Babbit, J. A., and Fitz-Hugh, Thomas, Jr.: Agranulocytic Angina, Arch. Otolaryng. **12**: 439 (Oct.) 1930. Thompson, W. P.: Am. J. M. Sc. **180**: 232 (Aug.) 1930.

blood cell count fell following this procedure. Each received three intravenous injections of nucleotide on admission. In each the temperature then promptly fell to normal but, owing to the short treatment, no essential change occurred in the blood picture and treatment was not resumed until two weeks later. In these chronic cases, in which, however, the patients were extremely ill, treatment was given for two weeks and then interrupted for two weeks over a period of four months. Only by such alternation could evidence as to the effectiveness of the material be obtained. In case 2 spontaneous recovery probably was taking place from the beginning, for at the end of each control period the white blood cell count was definitely higher than at the beginning of that period. At the end of each treatment period the same was true but the percentage rise during the treatment periods was consistently more than twice that during the successive control periods. In short, if no nucleotide was given the patient gained, but he gained faster under treatment.

The red blood cell and platelet counts rose *pari passu* with the white blood cell count and the patient was discharged entirely well two and a half months after entrance to the hospital.

In case 1, in spite of blood transfusion shortly after admission, both the white and the red blood cell count fell and continued to do so during the initial control period and during each successive control period the white blood cell count again fell, though less and less each time, until during the last interval without treatment the patient made a slight, spontaneous recovery so far as his white blood cell count was concerned. During the successive weeks of treatment between the control periods, however, there was a consistent rise in white blood cell count each time. This patient still is under observation. We feel that the evidence that the nucleotide acted favorably on the marrow is clear in each instance, particularly in case 1. Emphasis has been laid on the white blood cell counts rather than the red blood cell counts in these benzene cases as examination of case reports [9] makes it evident that on the white blood cell count depends the prognosis.

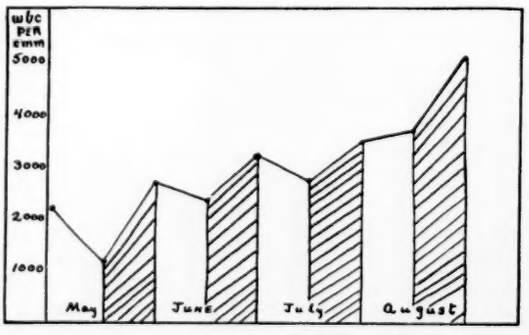

Chart 1.—Leukocytes in case 1, benzene poisoning: blank areas, no nucleotide; crosshatched areas, dosage with nucleotide.

The evidence for the effectiveness of the nucleotide in conditions of acute or subacute leukopenia rests in the uniform, prompt reaction on the part of the blood, the uniform and prompt fall of temperature and the consistent healing of mucous membrane ulcerations.

The evidence in the benzene cases consists in the consistently greater improvement in both cases when under nucleotide treatment than when this was withheld.

One can hardly expect, particularly in so small a series as this, to draw conclusions from a comparison of mortality rates. The conditions are too diverse to ascribe a general mortality, but the latest summary of cases [5] gives a mortality of 82 per cent and there seems to be but little evidence that the mortality of septic processes, uncontrolled by usual methods and associated with extreme leukopenia, differs markedly in its prognosis from that of classic agranulocytic angina. The mortality of our entire series, exclusive of the benzene cases, is 33 per cent in adequately treated cases. We

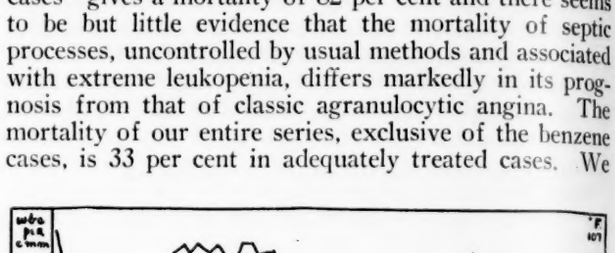

Chart 2.—Temperature and leukocytes in case 5.

feel that certainly no less than 60 per cent and probably 80 per cent of these patients would have died had they not received the nucleotide.

We feel, however, that less stress should be laid on the mortality statistics than on the peculiarly uniform favorable reaction of the blood, improvement taking place quite consistently about the fifth day, irrespective of the duration of disease prior to such treatment. It is noteworthy that previously published cases of cures do not follow this rule and that improvement was slow in these and occurred at various intervals after treatment was begun.

CONCLUSIONS

1. Twenty cases of malignant neutropenia of varied etiology have been treated with intramuscular and intravenous injections of nucleotides (K 96).
2. In fourteen of these twenty cases, recovery took place.
3. Clinical and hematologic improvement occurred quite consistently about five days after treatment was begun.
4. We believe that these nucleotides may have a definitely favorable effect on an inactive bone marrow in certain cases of malignant neutropenia and we believe that the substance is worth further trial in such cases.
5. The material is apparently of no benefit in leukemia or sepsis without neutropenia and leukopenia.

REPORT OF CASES [10]

CASE 1.—N. B., a white man, aged 24, a rubber worker, who entered the hospital, May 6, 1931, had been exposed to benzene fumes for thirteen months. Six months before entry he began to notice fatigue, weakness, dyspnea and pallor. These symptoms increased to the time of entry. On entrance, physical examination was essentially normal except for extreme pallor. His temperature was 100 F. The white blood cell count was

9. Hunter, F. T., and Hanflig, S. S.: Boston M. & S. J. **197**: 292 (Aug. 25) 1927.

10. For the sake of brevity, only four illustrative cases have been selected for immediate publication. The full case reports will appear in the reprints.

2,400 per cubic millimeter with essentially a normal differential count except that the platelets were greatly reduced. He received three injections of 0.7 Gm. of nucleotide intravenously on three successive days and 500 cc. of citrated blood ten days after entrance. Following the transfusion, his white blood cell count fell to 1,200 per cubic millimeter and the red blood cell count did not rise. He received no especial treatment for the next two weeks and then nucleotide, 0.35 Gm. intramuscularly, was given each day for two weeks, followed by an equally long period when the material was withheld. Such periods of therapy and omission of therapy have been alternated to date. During each period in which the nucleotide was withheld, his white blood cell count fell, while during each treatment interval it rose. Each successive fall was, however, less than the preceding one, until, during his last control period, he made a slight, spontaneous improvement (chart 1). At this time his red blood cell count was 2,000,000 per cubic millimeter and his white blood cell count 3,700. His platelets had increased to a low normal figure and he was very much better clinically. During the next period of treatment his white blood cell count rose sharply and his red blood cell count rose to 2,500,000.

CASE 5.—M. L. W., a white, American, girl, aged 6 months, was admitted to the Infants' Hospital, Boston, under the care of Dr. James Baty, Dec. 16, 1930, with a diagnosis of bilateral otitis media (pneumococcus) and diffuse bronchopneumonia (chart 2). Her temperature on admission was 106 F. Her condition gradually improved until, December 22, the temperature fell to 100. In the meantime her white blood cell count had risen from 21,000 to 30,000 per cubic millimeter, with 67 per cent of polymorphonuclear cells. From this time onward her white blood cell count fell rapidly. December 30, her temperature rose to 104, and a bilateral mastoidectomy was done without clinical improvement. Jan. 10, 1931, the white blood cell count was 3,100, with 2 per cent polymorphonuclear neutrophils, 42 per cent lymphocytes and 56 per cent monocytes. On this day 0.1 Gm. of neucleotide was given intravenously and she received 0.35 Gm. intravenously again, January 11. The white blood cell count rose rather abruptly and on January 14 reached 30,500, with 59 per cent polymorphonuclear neutrophils, 5 per cent myelocytes, 23 per cent lymphocytes, 12 per cent monocytes, 0.5 per cent basophils and 0.5 per cent eosinophils. It remained at approximately this level for eight days. During this time she had a normal temperature. From this time onward the white blood cell count and the total percentage of polymorphonuclear cells dropped day by day to reach a low level of 5,500 with 13 per cent of polymorphonuclear neutrophils, February 5, and on this day the temperature, which had been entirely normal since January 12, again rose to 103. Nucleotide, 0.35 Gm., was again administered intravenously. The next day the white blood cell count had risen to 15,000, with 42 per cent polymorphonuclear neutrophils, 8 per cent myelocytes, 34 per cent lymphocytes, 14 per cent monocytes, 1 per cent eosinophils and 1 per cent basophils. The temperature promptly dropped to normal until the patient was discharged, March 6, 1931.

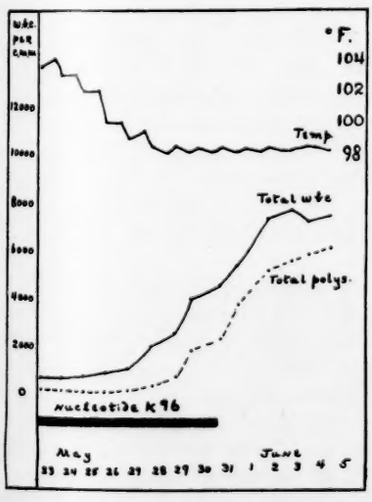

Chart 3.—Temperature and leukocytes in case 12, malignant neutropenia with sepsis.

CASE 12.—C. E. D., a married, American physician, entered the Massachusetts General Hospital, May 23, 1931. In 1918 he had had pansinusitis. Two weeks before entry he had caught cold and developed sinusitis. One week later the sinusitis became much worse and the patient developed fever and marked malaise. From that time on he became rapidly worse. Weakness was extreme. His temperature ranged between 99 and 102 F. Two days before entry both ethmoids were opened and drained but only very thin pus was obtained and no clinical improvement followed. For three days before entry the white blood cell count varied between 400 and 600 per cubic millimeter without any polymorphonuclear cells. One day before entry the lids of the right eye became markedly swollen. On entrance the patient was irrational, disoriented and extremely ill. There was marked tenderness over the frontal, ethmoid and maxillary sinuses on the right. There was diffuse redness of the throat. The temperature was 103, the pulse 120. The red blood cell count was 3,820,000 per cubic millimeter, the hemoglobin 10.9 Gm. per hundred cubic centimeters,[11] the white blood cell count 800 per cubic millimeter, polymorphonuclear neutrophils 10 per cent, lymphocytes 75 per cent, monocytes 7 per cent and unclassified 8 per cent (chart 3). Platelets were greatly increased. He was given 0.7 Gm. of nucleotide, May 23, 24 and 25, intravenously, and 0.35 Gm. intramuscularly, May 27, 28, 29 30 and 31 and June 1 and 2. May 28, the white blood cell count had risen to 1,600 per cubic millimeter, with 64 per cent polymorphonuclear cells, 32 per cent lymphocytes and 4 per cent monocytes, and on June 1 the white blood cell count was 5,000, with 69 per cent polymorphonuclear cells. Two days later the white blood cell count had risen to 7,500. At this time the differential count showed 57 per cent polymorphonuclear neutrophils, 34 per cent lymphocytes, 8 per cent monocytes and 1 per cent unclassified cells. The temperature gradually fell to normal on June 25, five days after treatment was begun, and clinical improvement was marked from that day on. June 9, a radical ethmoid and antrum operation was done by Dr. Harold Tobey. The white blood cell count rose to 24,900 the next day but then fell to normal and remained there until the patient's discharge, a month later.

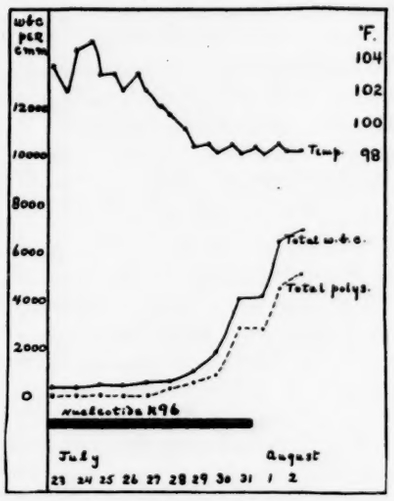

Chart 4.—Temperature and leukocytes in case 14, agranulocytic angina.

CASE 14.—H. G., an American housewife, aged 59, single, entered the Hartford Hospital under the care of Dr. J. E. Hutchison, July 23, 1931. For many years she had been an invalid following an organic central nervous system infection of unknown nature, which had left her legs paralyzed. Thirty-six hours before admission she had diarrhea, severe headache, fever and sore throat. She was pale and looked ill. The left tonsil was deeply ulcerated and the surrounding area of the throat was red. There was a large, tender node at the angle of the jaw. The physical examination was otherwise normal except for absent knee jerks and atrophy of the lower extremities. The temperature was 104.5, pulse 120 and respirations 24. The white blood cell count was 550 per cubic millimeter, 2 polymorphonuclear cells being found in three coverslip smears. The red blood cell count was 4,160,000 and hemoglobin 13.6 grams per hundred cubic centimeters (chart 4). Nucleotide was given in 0.7 Gm. doses intramuscularly daily from the 23d to the 31st and intravenously also on the 24th, 25th, 26th and 27th. Two days after entrance to the hospital an ulceration developed under the tongue and on the palate. Blood culture was negative. On the 24th, the temperature rose to 105 and then gradually fell, reaching normal on the

11. The total grams of hemoglobin per hundred cubic centimeters were calculated by Sahli hemoglobinometers calibrated so that 100 per cent was equal to 15.6 Gm. of hemoglobin per hundred cubic centimeters of blood.

29th, six days after treatment was begun. Her white blood cell count remained between 300 and 500 per cubic millimeter until July 30, seven days after treatment was instituted, when it rose to 1,700 with 48 per cent polymorphonuclear neutrophils, 1 per cent eosinophils, 28 per cent lymphocytes and 5 per cent monocytes. The blood platelets were normal throughout the course of her illness. The throat condition rapidly improved and the patient was entirely well, Aug. 3, 1931.

GASTRO-INTESTINAL ALLERGY *

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The frequency of gastro-intestinal symptoms arising from food allergy necessitates the writing of a new chapter in gastro-enterology. This is emphasized by my [1] experience, which indicates that food allergy explains much gastric and intestinal distress, some of which has eluded satisfactory diagnosis in the past.

LITERATURE

Gastro-intestinal symptoms in allergic patients have been noted by many observers. Smith [2] in 1909 described such disturbances resulting from buckwheat allergy. Richet recognized alimentary allergy in the first years of his studies and was responsible for the monographs of Barnathan [3] and of Laroche, Richet and Saint Girons [4] on the subject. In 1917, Cooke [5] reported the frequency of gastro-intestinal symptoms due to food sensitization. Schloss [6] in 1915 and especially in 1920 described the abdominal disturbances due to food allergy in infants and children. It remained for Duke [7] in 1921 and 1923 to stress the occurrence in adults of pain and other abdominal symptoms due to this cause. Since then, Andresen,[8] in a comprehensive article in 1925, Eyermann [9] in 1927, Alexander [10] in 1927 and Vaughan [11] in 1928 and 1930 have developed the subject. These articles as well as my contributions during the last six years and those of other students have been recently summarized.[1]

GENERAL CONSIDERATIONS

The following points must be remembered in the discussion of the subject:

1. Food allergy probably produces more symptoms in the gastro-intestinal tract than in any other part of the body, because of the contact of foods with its tissues.

2. Gastro-intestinal food allergy may originate at any time of life. It occurs most frequently in infancy and childhood. After its onset it is apt to persist for many years, as shown in table 3.

3. The various alimentary symptoms probably arise from edema of the mucous membrane and spasm of the smooth muscle, which produce disturbances in peristalsis and in function. It is likely that lesions similar to urticaria, canker sores, dermatitis and angioneurotic edema also occur in the gastric and intestinal mucosa.

4. Hepatic reactions are not infrequent, as will be shown later in this paper. Such reactions occur experimentally, especially in the dog. Allergic reactions in the urogenital tract, including the uterus, may also produce abdominal distress and pain.

5. Symptoms may be immediate, delayed or cumulative. After the elimination of the causative foods, symptoms may disappear in a few hours or may require from ten to fourteen days. In fact, symptoms at times persist for three or four weeks until the specific proteins are finally disengaged from the cells in the sensitized tissues.

6. The frequency of mild alimentary symptoms due to food allergy must be mentioned. Such symptoms are undoubtedly more frequent than the marked or severe ones.

TABLE 1.—*One Hundred and Fifty Patients with Gastro-Intestinal Food Allergy*

Age, Years	No. of Patients
0–10	7
10–20	9
20–30	23
30–50	72
50–70	39

7. Patients may be sensitive to a large number and variety of foods in the same way that they may be sensitive to all types of pollens. Various foods, moreover, produce varying symptoms in the same patient.[12]

8. Skin reactions by the cutaneous as well as by the intradermal method are infrequent in food allergy, especially after infancy. This is especially true in gastro-intestinal allergy as noted by several observers, particularly by Schloss.

9. The diagnosis and treatment of gastro-intestinal food allergy must be made (1) by means of diet trial for which my "elimination diets" are useful; (2) with the help of the patient's history of food dislikes and disagreements, and (3) with the aid of any skin reactions which occur and which can be shown by actual diet trial to be indicative of allergy.

Since food is the most frequent cause of gastro-intestinal allergy, this contribution will deal with it entirely. Alimentary reactions due to pollen sensitization have been described by Duke,[13] Eyermann,[9] Cohen [14] and myself.[1] The evidence for bacterial allergy as a cause of gastro-intestinal symptoms is not especially clear.

For purposes of discussion, a careful analysis of 150 cases of gastro-intestinal allergy with good or excellent results have been made. This is an extension of a similar study [1] on fifty cases, recently published.

* Read before the Section on Gastro-Enterology and Proctology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

1. Rowe, A. H.: Food Allergy, Its Manifestations, Diagnosis and Treatment with a General Discussion of Bronchial Asthma, Philadelphia, Lea & Febiger, 1931.

2. Smith, H. C.: Buckwheat Poisoning, Arch. Int. Med. **3**: 350 (May) 1909.

3. Barnathan, Leon: Alimentary Anaphylaxis, Clinical and Experimental Studies, Thèse, Paris, 1910-1911.

4. Laroche, Guy; Richet, Charles, Jr., and Saint Girons, Francois: Alimentary Anaphylaxis, translated by Rowe, University of California Press, 1930; French edition, Paris, 1919.

5. Cooke, R. A.: Protein Sensitization in the Human with Special Reference to Bronchial Asthma and Hay Fever, M. Clin. North America **1**: 721 (Nov.) 1917.

6. Schloss, O. M.: Allergy to Common Foods, Arch. Pediat. **32**: 349, 1915; Allergy in Infants and Children, Am. J. Dis. Child. **19**: 433 (June) 1920.

7. Duke, W. W.: Food Allergy as a Cause of Abdominal Pain, Arch. Int. Med. **28**: 151 (Aug.) 1921; Food Allergy as a Cause of Illness, J. A. M. A. **81**: 886 (Sept. 15) 1923.

8. Andresen, A. F. R.: Gastro-Intestinal Manifestations of Food Allergy, M. J. & Rec. **122**: 271 (Sept. 2) 1925.

9. Eyermann, C. H.: X-Ray Demonstration of Colonic Reaction in Food Allergy, J. Missouri M. A. **24**: 129 (April) 1927.

10. Alexander, H. L.: Localized Allergy, M. Clin. North America **11**: 399 (Sept.) 1927.

11. Vaughan, W. T.: Allergic Factor in Mucous Colitis, South. M. J. **21**: 894 (Nov.) 1928. Food Allergy in the Specialties and in General Medicine, Virginia M. Monthly **56**: 725 (Feb.) 1930.

12. For instance, one patient found that "onions gave appendiceal pain, rice gave nasal congestion, milk puffed her face and made her toxic and stupid, and peaches gave a generalized dermatitis."

13. Duke, W. W.: Food Allergy as a Cause of Abdominal Pain, Arch. Int. Med. **28**: 151 (Aug.) 1921.

14. Cohen, M. B., cited by Ecker, E. E., and Bisking, M. S.: Allergic Reactions of the Rabbit's Intestine During Anaphylactic Shock as Recorded Cinematographically, Arch. Path. **7**: 391 (March) 1929.

These statistics do not indicate the frequency of food allergy in infancy and in early childhood. Pediatricians are becoming aware of this etiology as a common cause of digestive disturbances, food intolerances, colic and pylorospasm. As an internist, my opportunity to study such conditions in children has been limited. My statistics, however, include patients of all ages and especially indicate the occurrence of gastro-intestinal food allergy in adult life.

TABLE 2.—*Frequency of a Family History of Allergy and of Various Manifestations of Allergy in a Series of One Hundred and Fifty Cases*

	Per Cent
Males	21
Females	79
Family history of allergy	66
Asthma or recurrent bronchitis	19
Hay Fever or nasal congestion	34
Urticaria or eczema	39
Angioneurotic edema	7
Migraine	41
Bladder allergy	7

The predominance of the incidence in females over that in males may be due in part to the willingness of women to seek medical advice. The occurrence of a family history of allergy in 66 per cent of the patients corresponds with the statistics of various students in other allergic disturbances. It is interesting, however, that a family history of allergy was present in 43 per cent of my [1] group of 400 students.

The present or previous occurrence of other manifestations of allergy is shown in table 2. Migraine in my experience and in the experience of Vaughan,[15] of Balyeat [16] and of Eyermann [17] is frequently due to food allergy and is thus included in this tabulation. The less frequent manifestations [1] of food allergy, such as arthralgia, and menstrual and neuralgic symptoms, are not listed.

TABLE 3.—*Occurrence of Various Symptoms in One Hundred and Fifty Cases of Gastro-Intestinal Food Allergy*

Gastro-Intestinal Symptoms	Per Cent
Canker sores	13
Coated tongue	18
Heavy breath	11
Distention	35
Belching	34
Epigastric heaviness	17
Sour stomach	21
Burning, pyrosis	20
Nausea	46
Vomiting	27
Diarrhea	16
Mucous colitis	14
Constipation	39
"Gas in bowels"	19
Pruritus ani	5
Pain and soreness in	
Epigastrium	27
Upper right quadrant	17
Upper left quadrant	3
Mid portion of abdomen	19
Lower part of abdomen	22
Colonic soreness	17
Ulcer type of pain	6

General Symptoms	Per Cent
Toxicity	25
Weakness	27
Irritability	15
Nervousness	25
Mental dulness and depression	24
General aching	13
Fever	5

Former Abdominal Operations	Number
Appendectomy	32
Cholecystectomy for stones	8 1
Hysterectomy	3
For supposed obstruction	2
For supposed perforation of ulcer	1
Total	47

Duration of symptoms	4 months to 55 years
Average	16 years
Average duration of relief	1.9 years
Excellent results	62 per cent
Good results	38 per cent

ORAL SYMPTOMS

Food allergy has been shown in my work to be a frequent cause of canker sores. Whether they are due to direct contact or to a gastric reaction is difficult to decide. It is my opinion that peptic ulcer in some patients may result from the action of digestive ferments on such canker-like lesions in the gastric or duodenal mucosa. Cracking of the lips or of the corners of the mouth, blisters on the tongue, lips or buccal membranes, swellings, white patches, and stinging or burning sensations in the mouth may likewise be due to food sensitizations. Patients frequently recognize walnuts, certain fruits or other unusual foods as definite causes of such lesions. More frequently, common foods are causative. A coated tongue or heavy breath due to disordered gastric or intestinal function resulting from food allergy is not uncommon.

GASTRIC SYMPTOMS

Certain patients have been relieved of a condition similar to globus hystericus suggesting allergic edema or spasm in the esophagus. A sensation of pressure or heaviness high in the epigastrium has been observed fluoroscopically. The relief from distention in the upper part of the abdomen, belching, sour stomach, pyrosis and heaviness, in my group of patients indicated food allergy as a common cause of these symptoms. Nausea and to a less extent vomiting were frequently present. Epigastric soreness and pain simulating that of ulcer will be discussed later.

INTESTINAL SYMPTOMS

Diarrhea due to allergic edema, spasm or more chronic reactions from food allergy was persistent or intermittent in 16 per cent of the patients. Mucous colitis of varying severity occurred in 14 per cent and was relieved by the elimination of allergy-producing foods. The cramping and colic of infancy that are due to food allergy are comparable. Constipation was apparently due to food allergy in 39 per cent of my patients. The tendency to spasm in smooth muscle, due to food allergy, would point to this cause as a most logical one for constipation and for the spasm of mucous colitis. Alternating attacks of constipation and diarrhea often accompanied by mucus were present in a few cases. Most of the patients with constipation had taken large amounts of fruits and vegetables and frequent enemas and laxatives without previous relief. After their bowel activity became normal, patients often found that the inclusion of a minute amount of a specific food reproduced their symptoms, offering dramatic evidence of food allergy as the cause of their constipation.

Lintz [18] has reported intestinal bleeding from allergic reactions in the bowel. I have observed this in children and have obtained the history of bleeding in adults, apparently due to such a cause. Experimental studies also point to allergy as one cause of idiopathic hemorrhage. Allergic spasm in the sigmoid and rectum are not infrequent and with accompanying spastic constipation may predispose to hemorrhoids. Pruritus ani due to food allergy has been reported by various students including Andresen,[8] Vaughan [11] and myself [1] and as such must be considered as a localized allergic dermatitis. A recent case made me consider the possibility

15. Vaughan, W. T.: Allergic Migraine, J. A. M. A. **88**: 1383 (April 30) 1927.
16. Balyeat, R. M., and Brittain, F. L.: Allergic Migraine, Am. J. M. Sc. **180**: 212 (Aug.) 1930.
17. Eyermann, C. H.: Allergic Headache, J. Allergy **2**: 106 (Jan.) 1931.
18. Lintz, W.: Gastro-Intestinal Bleeding in Asthma and Other Forms of Allergy, Boston M. & S. J. **25**: 368, 1925; Appendectomies in Three Hundred Cases of Asthma and Other Forms of Allergy, New York State J. Med. **25**: 368 (March 6) 1925.

that pollen allergy as well as food allergy may give rise to this condition.

ABDOMINAL PAIN AND SORENESS

Abdominal pain and soreness due to food allergy may occur in any part of the abdomen and may simulate acute as well as chronic conditions which may lead to unnecessary surgery. This has recently been stressed by Alvarez,[19] and many years ago Osler[20] warned against surgical intervention in such patients.

1. Colonic pain and soreness due to food allergy are quite common. They occur most frequently in the cecum and ascending colon and are due in part to the normal delay of food residues in this part of the bowel. Such pain often leads to unnecessary operations, as will be pointed out. A dull, rather constant, burning distress is characteristic. Former abdominal scars often become tender in the presence of food allergy and suggest the possibility of adhesions or of small ruptures. These symptoms may be confined to the lower part of the abdomen, but more often the whole right side is affected. The distress may radiate into the right flank and back or be present over the hepatic area as discussed later.

Allergic reactions may produce soreness and pain in any other part of the colon. At times the whole large bowel is affected, especially in the presence of mucous colitis. At other times, the region of the splenic flexure, the descending bowel, the sigmoid or the rectum may be the seat of localized allergy. It is my opinion that the so-called irritable bowel, for which no satisfactory etiology has been found, may be due to food allergy.

(*a*) Symptoms suggesting acute or chronic appendicitis may be due to food allergy. Lintz[18] has stressed this possibility and has felt that many appendixes are removed unnecessarily because of such allergic reactions. My experience corroborates his opinion, as evidenced by 32 appendectomies performed on my 150 patients, with practically no relief. As stated before, allergic reactions in the cecum and in the appendix can predispose to secondary infection. The fact that acute allergy may produce fever,[1] as well as leukocytosis, must be kept in mind in differential diagnosis. Eosinophilia, moreover, is not necessarily present in allergy. Pain and soreness in the lower right quadrant without rigidity necessitate the consideration of such sensitization as a possible cause. However, operations should never be postponed when involuntary rigidity and other typical symptoms of acute appendicitis are present, even though there is evidence of food allergy in the patient.

(*b*) Symptoms suggesting cholecystitis may arise from food allergy, as reported by me[1] in 1928 and by Graham, Cole, Copher and Moore in 1929.[21] These writers, in their book on the gallbladder, on the basis of the studies of Alexander and Eyermann enumerated food allergy as a third possibility in their differential diagnosis of cholecystitis. Their second consideration, moreover, was mucous colitis, which, in my experience and in that of Vaughan,[11] Hollander,[22] Beecher,[23] Balyeat[24] and others, is frequently due to food allergy. Soreness in the upper right quadrant, due to food allergy, may be due to a colonic reaction as suggested by Eyermann.[9] In my opinion it may also be due to an allergic reaction in the liver itself, as evidenced by the swelling of the liver and slight jaundice, which have been reported in severe migraine.[1] I have also observed swelling of the liver and mild jaundice in one patient without migraine who had symptoms of cholecystitis. Her examinations were entirely negative and she was completely relieved by "elimination diets," which excluded all vegetables except spinach, carrots and artichokes. The rather common occurrence of such pain in the upper right quadrant is shown by its presence in 17 per cent of my 150 patients.

Food allergy produces distress in the upper right quadrant, for which unnecessary cholecystectomies have been done in the past, even in the presence of negative roentgen observations and of a gallbladder that appeared normal at operation. In my present series of 150 patients, the gallbladder was removed in 8 patients without symptomatic relief. It must be mentioned that allergy in the liver and in the gallbladder may predispose to cholecystitis and gallstones, as originally suggested by Duke.[7]

(*c*) Pain and soreness suggesting peptic ulcer may also occur in patients suffering with food allergy. When roentgen studies are negative, such a cause should be kept in mind. This was necessary in nine of my patients in whom the symptoms were controlled by "elimination diets."

As I have already stated, lesions in the gastric or duodenal mucosa similar to canker sores in the mouth probably occur as a result of food allergy. Because of the action of the digestive juices these sores might produce peptic ulcers. At present I am studying a patient with an early peptic ulcer whose pain is well controlled by frequent feedings of a soft and liquid modification of my routine "elimination diets" 1 and 2, but who has a severe migraine and a recurrence of ulcer pain when she takes milk for a few days.

In 1926, Carr[25] studied a man with a duodenal ulcer who had severe headache, nausea, drowsiness, urticaria, a fever of 101.2 F. and tender painful joints whenever he was placed on a milk diet. Sterling[26] reported two such cases in 1929 and I have reported three others. Such allergy must be kept in mind in the use of a routine Sippy diet and enforces the necessity of ever remembering that allergic reactions may be present to any food in a diet.

(*d*) Pain suggesting intestinal obstruction may be due to food allergy. Such pain may be very severe, sudden or rather gradual in onset and may be associated with nausea, vomiting, bowel tenesmus and severe spasm. Mild fever and leukocytosis may occur. Angioneurotic edema of the intestine has been found at operation, as reported in the literature.[1] It is probable that severe localized allergic spasm in the small intestine might also cause such symptoms. When allergy is suspected, the effect of several hypodermic injections of epinephrine (10 to 15 minims [0.6 to 0.9 cc.] of a 1:1,000 dilution) and of large warm enemas should be determined. If the symptoms persist and definite involuntary rigidity is present, exploratory operation should not be delayed.

19. Alvarez, W. C.: Food Sensitiveness and Conditions That May Be Confused with It, M. Clin. North America **12**: 1589 (May) 1929.
20. Osler, William: On the Surgical Importance of the Visceral Crises on the Erythema Group of Skin Diseases, Am. J. M. Sc. **127**: 751, 1904; Visceral Lesions of Purpura and Allied Conditions, Brit. M. J. **1**: 517, 1914.
21. Graham, E. A.; Cole, W. H.; Copher, G. H., and Moore, Sherwood: Diseases of the Gallbladder and Bile Ducts, Philadelphia, Lea & Febiger, 1928.
22. Hollander, E.: Mucous Colitis Due to Food Allergy, Am. J. M. Sc. **174**: 495 (Oct.) 1927.
23. Beecher, W. L.: Allergic Mucous Colitis, Clin. Med. & Surg. **36**: 568 (Aug.) 1929.
24. Balyeat, R. M.: Allergic Diseases: Their Diagnosis and Treatment, Philadelphia, F. A. Davis Company, 1930.
25. Carr, J. G.: Hypersensitiveness to Milk Complicating the Treatment of Duodenal Ulcer, M. Clin. North America **9**: 1409 (March) 1926.
26. Sterling, A.: Food Allergy or Gastro-Intestinal Anaphylaxis, Med. J. & Rec. **129**: 610 (June 5) 1929.

Unnecessary operations are also done in allergic patients who have symptoms suggestive of peptic ulcer, gallbladder disease or appendicitis, when severe pain due to food allergy arises. Thus a man had had recurrent right sided abdominal pain suggestive of ulcer though the roentgen observations were not definite. A severe attack of upper abdominal pain indicated possible perforation. An exploratory operation revealed nothing abnormal, and it has since been determined that he had a gastro-intestinal allergy especially to wheat.

GENERAL SYMPTOMS

Many patients with gastro-intestinal allergy have mild or severe degrees of "allergic toxemia" due to food.[1] The relief from the poisoned feeling, the mental depression, nervousness, weakness and generalized aching, resulting from the proper "elimination diet" is most acceptable. Anorexia due to food allergy occurs in both children and adults, and such a cause must always be kept in mind. Thus a boy of 17 had never eaten well and for several years had had increasing pain and nausea after most meals. His examinations gave negative results. Migraine and abdominal symptoms due to egg were present in his mother. The patient gave negative food reactions. With the use of "elimination diets," egg was found the sole cause of his anorexia and intestinal symptoms.

TABLE 4.—*Laboratory Studies on One Hundred and Fifty Patients with Gastro-Intestinal Food Allergy*

Roentgen Studies of the Gastro-Intestinal Tract	Number
Normal	62
Moderate duodenal stasis	5
Marked dilatation of cap	1
Spastic colon	12
Total	80
Gallbladder Studies After Dye:	
Normal observations	14
Stones	1
Negative shadows	1
Questionable pathology	1
Total	17

Stomach Analyses	Number
Negative	65
Hypochlorhydria	7
Achylia	8
Total	80
Positive Skin Reactions:	**Per Cent**
Foods alone	15
Foods with other reactors	25
Animal emanations	7
House dusts	6
Pollens	13
Orris	0.6
Miscellaneous	1.3

DIAGNOSIS

Diagnosis demands a most careful history, physical examination and all indicated laboratory studies. Stomach analyses, stool analyses, and roentgen studies of the gastro-intestinal tract, including colon enemas and gallbladder studies, should be done when any indication exists. Recognition that various digestive symptoms may accompany any metabolic and constitutional disorders, such as anemia, hypothyroidism and cardiovascular disease, makes necessary a careful diagnostic study for such conditions.

The following methods of investigation to determine the presence of food allergy are available:

1. The personal and family history of some allergic disorders, such as those listed in table 2, should cast suspicion on food allergy in the patient. Family histories of intolerances for specific foods, such as for milk or eggs, are obtained in two or three generations from certain patients. The tendency toward development of a definite type of allergy, such as allergy to pollen or to food, moreover is frequently transmitted.

2. The history of food dislikes or disagreements should suggest food allergy. Such statements as "he never drank milk since he knew anything" or "apples were always poison to me" are often elicited. However, many patients with food allergy are not aware of any food disagreements.

It is most important that the history of every patient should include definite evidence that thorough questioning for the presence of allergy in the family has been done or that a personal history has been taken and that allergy as a cause of symptoms in the patient has been considered.

3. Skin testing with the cutaneous method and also with the intradermal method may indicate possible food allergies. Skin reactions to other types of allergens make the presence of food allergy worthy of consideration. My studies, however, show that food reactions in the presence of actual allergy are infrequent.

4. Because of such negative skin reactions, the use of diet trial by means of my "elimination diets," modified by any skin reactions that occur or by a history of food disagreements, has been necessary for the determination of food allergy. These diets have been described several times in the last few years [1] and will not be discussed again. The reproduction of symptoms by the inclusion of suspected foods in the diet indicates specific offenders.

ROENTGEN STUDIES

The diagnostic studies in this series of 150 patients with gastro-intestinal allergy indicated the advisability of roentgen studies of the gastro-intestinal tract in 80 instances. All were quite negative except for a spastic colon in twelve and moderate duodenal stasis in five. Whether food allergy was a cause of such stasis is not possible to answer at present. Marked dilatation of the duodenal cap with moderate stasis in the duodenum was present in one patient. Her severe nausea and epigastric distress were entirely relieved by the use of "elimination diets." The dilated cap persisted, however, indicating that the symptoms had been due to specific foods. The demonstration of Eyermann [9] that disharmonic peristalsis in the colon was due to wheat in one of his patients is of interest.

I [1] have stated elsewhere that roentgen studies should not be done with a milk vehicle for the barium in patients suspected of food allergy, because of the frequency of milk allergy. When milk allergy is present, marked disturbance in function and peristalsis is apt to result. For several years I have used a corn or tapioca gruel to suspend the barium when given to such patients. Studies of the normal reaction in the stomach and intestine with such vehicles, as well as roentgen studies of the gastro-intestinal tracts of patients with various symptoms due to food allergy, are now in progress.

Gallbladder studies in seventeen patients showed normal results in fourteen. It is interesting that symptoms persisted after the removal of gallstones in one patient and were relieved only by the elimination of his allergy-producing foods. Gallbladder studies in other patients were not indicated, because of relief afforded by "elimination diets."

TREATMENT

1. Elimination of the specific foods productive of allergy is necessary for the relief of symptoms. With the use of my "elimination method" such foods can gradually be determined and a final diet which satisfies all metabolic and caloric requirements can be arranged.

2. Desensitization to allergy-producing foods may occur in a few weeks or months with their total exclusion from the diet. In some patients, however, such a

result is never obtained. The successful desensitization to foods by hypodermic and oral methods has been described in the literature,[1] though such results are usually difficult to obtain.

3. Denaturization of foods by heat has been reported for many years as a successful method of modifying the protein molecule, thereby destroying its allergic reaction. Recently Ratner [27] has emphasized its value. Lactic acid milk or milk cooked with or without cereal for long periods, and other dried or heated foods have been suggested. Recently a superheated milk has been advised. In my experience, however, many patients cannot tolerate such modified foods.

4. General therapy consists of the following measures:

(*a*) Impaired digestion must be remedied. In fact, this has been offered as a cause of the allergic reactions to foods, originally by Richet and recently by Brown.[28] However, my experience does not substantiate such a possibility. Stomach analyses were done on eighty of my patients in whom any indication for such study was present. Normal results were found in 81 per cent and achylia was present in only 10 per cent.

If a deficiency of acid is found, proper acid therapy will often help digestion, though it does not prevent allergic reactions from specific foods. The acid therapy suggested by Brown and recently by Beckman [29] has also been used, without results in patients in this series. The use of trypsin, pancreatin and pepsin in large and small doses and in enteric coated capsules and granules, moreover, has been of no help in preventing allergic reactions to foods.

(*b*) The use of peptone hypodermically and orally has ameliorated symptoms due to food allergy in a few patients. In general, however, it has been useless. At present some indications of relief are resulting from my use of specific food peptones as suggested by Urbach,[30] especially in patients with dermatitis. No definite conclusions of their value in gastro-intestinal symptoms due to food allergy are possible at this time.

(*c*) Calcium therapy, the use of quartz light, sun therapy, viosterol, and nonspecific vaccine and protein therapy have been of little help. However, their possible effect on membrane permeability must be kept in mind. Likewise the demonstrated effect of humidity [1] on membrane permeability, as an explanation of the relief that dry climates accord certain symptoms due to food and other types of allergy, must be remembered. Various measures for the improvement of general health and energy are important. Epinephrine in from 8 to 15 minim (0.5 to 0.9 cc.) doses of a 1:1,000 dilution may be tried for the relief of acute allergic alimentary symptoms. Failure of relief, however, cannot rule out food allergy.

The use of enemas or colonic irrigations hastens the recovery from symptoms due to food allergy in some patients. However, it does not eliminate the food proteins bound up with the cells of the sensitized body tissues, and I have never used such measures as a routine.

(*d*) As already stated, gastro-intestinal allergy is at times associated with pathologic conditions such as appendicitis, cholecystitis or peptic ulcer. These conditions should be treated according to accepted methods while proper diets control the food allergy. Nervousness as a common cause of indigestion, as stated by Alvarez,[31] is of marked importance, though it should not be too readily accepted as the sole cause of symptoms in patients in whom indications of allergy exist.

242 Moss Avenue.

27. Ratner, Bret: Possible Cause of Food Allergy in Certain Infants, Am. J. Dis. Child. **36**: 277 (Aug.) 1928.
28. Brown, O. H.: Food Sensitization and Its Treatment, Southwestern Med. **13**: 210 (May) 1929.
29. Beckman, Harry: Allergy and the Acid Base Balance, J. A. M. A. **95**: 1582 (Nov. 22) 1930.
30. Urbach, E.: Oral Desensitization in Dermatoses Due to Food Allergy by Means of Specific Peptones, Klin. Wchnschr., 1930, p. 2046.

ABSTRACT OF DISCUSSION

DR. WARREN T. VAUGHAN, Richmond, Va.: In those cases in which I have failed to get positive skin reactions, my experience with the elimination diets is entirely comparable to that of the author. Dr. Rowe has drawn up a series of elimination diets which may be tried one after another until one is found which relieves the patient of symptoms. Then one food after another is added until one is found which produces symptoms and this is then permanently left out of the diet. In this way the diet is built up. The sensitization studies fail to show the positive allergenic food in about 50 per cent of cases, but I wish to emphasize that any method which will relieve the physician of 50 per cent of his subsequent labor should be employed as a preliminary basis for the study. As a rule, sensitization is multiple. If skin tests are not done first, and the patient happens to be sensitive to three, four or five different foods, several of which appear in the elimination diets, he will not be relieved at all. The elimination diets save a great deal. They can be tried first, if desired, but if relief is not afforded one should bear in mind that the patient may still have food allergy. The case has not been completed until after the sensitization studies have been made also, and in my own experience these should be the point of departure.

DR. JOHN L. JELKS, Memphis, Tenn.: I have recognized and in my writings have reclassified types of colitis, one variety being allergic colitis. It is as much an entity as anything one may find. If one looks into an intestine through a sigmoidoscope at, for instance, an amebic ulceration, where the epithelium has been eroded, one will find food products sticking to those areas; they do not stick to a normal mucous membrane. I have not only reclassified colitis, one type being allergic, but I have described that colitis as edematous, red mucous membrane. There is one variety of allergic colitis that has been of supreme interest to me. I have suspected, at least, that there is an allergic state set up by protozoan, protein material, for, as I get rid of amebic histolytica protozoa, my patients get better or are relieved of that allergic state. I frequently find it necessary to use the method of elimination of certain diets and especially I find in many of these cases acute conditions in which it is necessary to use epinephrine.

DR. A. F. R. ANDRESEN, Brooklyn: I want to stress the importance of a complete gastro-intestinal study in all cases of suspected allergy, because so frequently an organic condition coexists with the allergy. Dr. Rowe spoke of milk sensitization and called attention to the fact that the milk-barium mixture used in a roentgen study might cause allergic manifestations while passing through the gastro-intestinal tract. We have found that the cocoa mixtures now used with barium must also be considered in that connection because many patients are sensitive to cocoa, and very peculiar disturbances of motility have been found in these individuals in the course of a gastro-intestinal series. I have found at times in patients in whom I have suspected an acute condition of the abdomen that a dose of solution of epinephrine, from 12 to 15 minims (0.75 to 1 cc.) intramuscularly, will clear up the symptoms as rapidly as a similar injection will sometimes clear up an asthmatic attack. Such an injection cannot do harm and is often distinctly helpful. I am glad that Dr. Jelks spoke of colitis as being occasionally allergic in origin. I feel that many cases are due to allergy, and the removal of certain foods to which the patient is sensitive will be the beginning of an improvement. Final relief of all symptoms will take a longer time, as the organic changes take time to clear up. As Dr. Rowe emphasized, no specific protein therapy has yet been of essential help. The real treatment consists in the removal of the offending foods from the diet.

31. Alvarez, W. C.: Nervous Indigestion, New York, Paul B. Hoeber, Inc., 1930.

DR. ANTHONY BASSLER, New York: I should like to have some one explain to me just what allergy is. There is quite an interest and a fad in allergy in all departments of medicine, and now physicians are becoming interested in allergy in the gastro-intestinal tract as a hypersensitiveness to certain specific proteins although physiology teaches that all proteins are reduced to simple peptone bodies and those that are not so reduced are usually eliminated in the feces. May not these symptoms be due to certain sugars? Does so-called allergy produce a congestive condition of the gastro-intestinal tract? We can't agree on allergy in angioneurotic edemas in many of the distinctly neurotic individuals in whom it occurs. Is allergy alone a subject of such broad and vast application in all the abdominal conditions that Dr. Rowe suggests? And, in addition to sensitiveness to foods, there is the question of amounts of foods and the matters pertaining to food bacterial products that occur. Why harp on allergy or only food sensitiveness when undoubtedly throughout the intestinal tract bacterial invasions are more important than matters of food? Until stool studies comprise much more extensive examinations than has been suggested (for example, the examination, through at least a dozen different hard mediums, of stools from test diets; the taking of subcultures and the study of the bacteria in their characteristics), I do not see how one can say that foods alone are the total side of this problem. Until something is known about the metabolism of these foods, their conjugation, the production of toxic bodies in the blood, their elimination in the stools, urine, sweat, blood, respiration, and the like, and the matter of oxidation of the combining substances, I feel that to consider only allergies from foods alone is but a small part of this subject. Gastro-intestinal allergy no doubt is a clinical entity and has some application, but I am of the belief that the food bacterial side and the straight bacterial side must be taken into first consideration in the production of the conditions that Dr. Rowe has shown. The subject is undoubtedly one of importance; it is not a matter of specific food proteins alone, and many other sides of the problem should be taken into consideration.

DR. SIDNEY L. COHEN, Newark, N. J.: I have a few cases that bring the whole subject of allergy to my mind. One is the case of a woman of about 25, operated on for a so-called acute appendix, which did not reveal anything in the appendix but showed five diverticula of the sigmoid. Before operation she did not have any sensitiveness to food. Postoperatively there developed an inflammation of the maxillary gland, cramps and constipation. Proctoscopic examination revealed an edematous inflamed colon and the only thing that could relieve her was the elimination of dry bread. Another patient was sent to me with a diagnosis of acute ulcerative colitis. He had absolutely no ulcerative colitis. This patient was not helped by the so-called diplococcus of Baargen, but under a strict regimen of diet the condition was cleared up.

DR. WILLIAM LINTZ, Brooklyn: I believe that the autonomic nervous system plays an important rôle in allergy. The gastro-intestinal form is not an exception to the rule. This explains its variability and intermittence. Belladonna has found more service in gastro-enterology than elsewhere, because of its action on the autonomic nervous system, and the recognition of the excellent clinical results obtained in this disease. That the psyche and the endocrine glands, especially the suprarenal and the thyroid, can materially influence the autonomic nervous system is too well known to need discussion. It is mainly due to this fact that the gastro-intestinal form of allergy is confused and treated as psychic, nervous and functional indigestion. And yet it is of vital importance to recognize and separate the latter group from gastro-intestinal allergy, because it clears the atmosphere for definite, beneficial therapeutic results. An irritable nervous system is sometimes not enough to produce symptoms without the specific allergens. Hypotension and underweight are frequently observed in this disease. On the other hand, the symptoms are likely to be unusually severe when one has an irritable nervous system plus the specific allergen. Convulsions in gastro-intestinal allergy are not confined exclusively to children. Of all the forms of anaphylaxis, I find skin allergy the most frequent association and it often gives the first clue to the true nature of this disease. At the beginning of this work the diagnosis and treatment of gastro-intestinal allergy are difficult and discouraging. Often the only allergic history obtainable is in the offspring. This point should never be omitted in questioning patients. Often after severe vomiting and diarrhea as the result of ingesting allergens, the symptoms persist under strict antiallergic diet and even after ingestion of water. This is due to the starvation acidosis, and dextrose by rectum should precede feeding by mouth. The loss of chlorine acts in a similar manner. The most constant pathologic change in anaphylaxis that I know of is capillary hemorrhage. It occurs in this disease, not only under the skin in the form of "black and blue marks," epistaxis, bleeding gums, and so on, often exhibited by these patients, but, furthermore, macroscopic and much more often microscopic blood is found in the gastric and intestinal contents and urine during an allergic attack or shortly thereafter, in the great majority of these cases. When other causes can be excluded, this otherwise puzzling observations forms an important factor in the diagnosis.

DR. ALBERT H. ROWE, Oakland, Calif.: In regard to the use of skin tests, my original article in 1928 stated definitely that these "elimination diets" which I proposed should be modified by skin reactions, if any were obtained, and by the history of any food dislikes or disagreements which a patient might give. I feel, however, that skin reactions are not always available and readily usable in the hands of the average physician. There is a great deal of food allergy that every physician is encountering every day and I don't believe that every man is able to do good skin testing, particularly when it is necessary to do intradermal tests to be sure that the skin reaction is negative. So I have proposed that my standardized "elimination diets" may be used, if it is necessary, without skin reactions, according to my instructions formerly published. In regard to Dr. Bassler's questions, I am not absolutely sure that allergy is the result of a sensitization to proteins. I think that it is, in practically every case. The interesting work being done now in relation to specific carbohydrates indicates that they, in combination with proteins, may produce allergic reactions. In general, one may define allergy as an unusual reaction to a given substance, and I think that that reaction is due to a protein hypersensitiveness. I feel that it is not necessary to investigate these patients further along the lines Dr. Bassler has indicated, if good results are obtained with my elimination diets or other diet trial. Many of these patients with colitis and other gastro-intesinal allergies are remarkably relieved by the simple dietary eliminates. My diagnosis was finally made on the basis of relief of symptoms. I feel that if physicians will recognize the frequency of food allergy and use some of the suggestions that the various students of allergy have made in the last eight or ten years, particularly in the use of diet trial for the determination of such allergizing foods, they will be amply rewarded and will realize that food allergy is quite common. I think that the failure to recognize this frequency of food allergy is due to the fact that allergists in the past have been depending too much on positive skin reactions for the determination of food allergy. As I review the literature on gastro-intestinal conditions, including migraine, that might have been due to food allergy, I see that it is repeatedly stated that skin tests were done and negative reactions were obtained, thus ruling out the presence of allergy. That is far from the truth, and to all I recommend the importance of dietary trial and the use of my elimination method for the determination of such allergies.

To Teach, to Practice and to Investigate.—When the movement looking forward to the emancipation of medicine from the current needs of practice began, the opportunities of the clinics were reserved for men holding strictly academic posts. Here again there were introduced limitations which proved to be intolerable. Unless provision is made for the various functions implicit in medicine, medicine will remain, as I have said, tied either to practice or to research. The forward movement of the whole discipline will be hindered. If there is to be free development of all the functions of medicine, the impediments to growth should be removed. Define the phases, and all who are concerned become free. On the basis of these considerations it becomes possible, perhaps for the first time, to describe without unfortunate reserve the several activities to which an interest in disease gives rise—to teach, to practice and to investigate. —Cohn, A. E.: Medicine, Science and Art, Chicago, University of Chicago Press, 1931.

TREATMENT OF ADDISON'S DISEASE WITH THE CORTICAL HORMONE OF THE SUPRARENAL GLAND

SUMMARY OF IMMEDIATE RESULTS IN TWENTY CASES TREATED WITH THE PREPARATION MADE BY SWINGLE AND PFIFFNER *

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Investigators have attempted for many years to isolate the cortical hormone of the suprarenal gland in such a form that it might be used in the treatment of Addison's disease. The preparation of an extract of the suprarenal cortex that would maintain indefinitely the life of completely suprarenalectomized cats was announced by Swingle and Pfiffner [1] in March, 1930. Their method of extraction [2] was such that they were able not only to obtain an active extract but also to obtain it in such quantity as to permit its use in the treatment of patients with Addison's disease. The Mayo Clinic was permitted to test this product clinically.[3] In January of this year, four of us [4] reported the results obtained in the treatment of seven cases of Addison's disease. The results showed that this extract is strikingly effective in these cases and is life saving in some. We now wish to summarize our experience with this material in the treatment of twenty patients with Addison's disease and in the treatment of twenty patients presenting various other complaints.

Before the results are presented, it is essential to realize that the supply of the hormone has been meager, the shipments irregular, and that our patients, after preliminary treatment in Rochester, have returned to their homes in various parts of the country. An effort has been made to learn the subsequent progress of these patients and to help their physicians at home in their continued care. It should be realized, further, that from time to time patients in various stages of Addison's disease have appeared at the clinic without previous warning; some have been brought into the hospitals on stretchers in a condition of collapse and in dire need of treatment. This has happened at times when hormone was not available for treatment. In order to appreciate the difficulties, it is further necessary to realize that the majority of these cases are tuberculous in origin and that tuberculous processes must be combated in other organs and tissues as well as in the suprarenal glands.

The histories of the first seven cases of our experience have been presented in the earlier report.[4] Only the subsequent developments in these cases are reported here.

RESULTS

The response of the majority of these patients to treatment has been striking. The nausea and vomiting stop, and the appetite reappears. There is gain in weight and strength. The pigmentation decreases, and the patients regain a sense of both physical and mental vigor and well being. The blood pressure may increase slightly but this for the most part is a response to increased activity and not a specific effect of the cortical extract. Almost all the patients who received adequate treatment made this type of response, although there has been considerable variation in the behavior of individual patients. From the standpoint of detailed consideration the cases may be presented in groups. The cases will be numbered consecutively throughout, but cases which have been reported before will be designated.

GROUP 1.—The patients of this group did not do well, even though apparently they were given adequate treatment. There was one case in this group:

CASE 1 (the fifteenth case in our experience; not reported before).—A married Jewish woman, aged 44, was admitted to the hospital, March 5, 1931. She was carried in on a stretcher because of extreme weakness, which was her main complaint. Five years before her admission she had suffered with an attack of "influenza" which had lasted from two to three weeks, and since that time she had never felt strong and well. For from eighteen to twenty-four months before her admission she had complained of exhaustion, pains in the lumbosacral region, and dyspnea on exertion, with frequent attacks of nausea, anorexia and extreme weakness, which had confined her to bed for several days at a time. About eight months before admission to the hospital, a diffuse brown pigmentation of the skin with scattered brown and black freckles had appeared. During the last three months she had been more or less continually nauseated, had vomited occasionally, had lost 35 pounds (16 Kg.) and had been bedridden. Her home physician had made a diagnosis of Addison's disease and for the last year had administered the Muirhead treatment.

The patient presented the picture of complete exhaustion. The entire skin was brown, with more pronounced pigmentation over the forehead, about the eyes, over the lower part of the spinal column, about the nipples, and around the anus. There were innumerable dark freckles scattered over the body. The mucous membrane lining the mouth was diffusely pigmented. The heart was small and the sounds were faint. The blood pressure was 105 mm. of mercury, systolic and 70 diastolic. The lungs and abdomen were negative to examination, and pelvic and rectal examination revealed nothing unusual. Laboratory studies disclosed a normal erythrocyte and leukocyte count and a normal concentration of hemoglobin. Blood chemical values were essentially normal. Results of urinalysis and the Wassermann test of the blood were negative. Excretion of phenolsulphonphthalein was 60 per cent in two hours. The basal metabolic rate was recorded as —33 and —28 per cent. Roentgenograms of the thorax and of the suprarenal regions gave negative results.

In the first two weeks of hospitalization the patient was given 30 cc. of the cortical hormone. There was a moderate but definite diminution of the pigmentation over the forehead and nose, and the basal metabolic rate rose to —21 per cent. It was decided to attempt more vigorous treatment, and in the next ten days 80 cc. of the cortical hormone was administered. At this time the patient felt improved, she slept well, ate better than at any time previously, and did not complain of nausea. She continued, however, to feel exhausted and extremely weak,

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1. Swingle, W. W., and Pfiffner, J. J.: An Aqueous Extract of the Suprarenal Cortex which Maintains the Life of Bilaterally Adrenalectomized Cats, Science **71**: 321-322 (March 21) 1930.

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3. Rowntree, L. G.; Greene, C. H.; Swingle, W. W., and Pfiffner, J. J.: The Treatment of Patients with Addison's Disease with the "Cortical Hormone" of Swingle and Pfiffner, Science **72**: 482-483 (Nov. 7) 1930.

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although she remained in bed. The basal metabolic rate was recorded as —11 per cent. During this course of treatment the patient complained of symptoms appearing from one to two hours after she had received the intravenous injections of the cortical hormone. These symptoms consisted of nervousness, nausea, increase in the sensation of muscular weakness, and a feeling of cold throughout the body, for relief of which hot water bottles were required. A similar group of symptoms following the injections had not been observed in any of our other cases. Dilution of the hormone with an equal amount of saline or dextrose solution did not avert the reaction.

In the next period of two weeks the patient received an additional 80 cc. of the cortical hormone without definite improvement. In addition to her previous complaints she began to have an aching pain in the right upper abdominal quadrant, which was projected around the costal margin to the right costovertebral angle.

In a period of four days, 9 grains (0.6 Gm.) of desiccated thyroid extract was given, and the basal metabolic rate became elevated to —2 per cent. The patient complained of feeling worse, however, with palpitation and generalized muscular aching. The appetite was unimproved.

On the sixty-first day of her stay in the hospital, the patient complained of extreme nausea, vomited repeatedly, and refused to take food or fluid. At this time she had received a total of 315 cc. of the cortical hormone. It was deemed advisable to give 1,000 cc. of 10 per cent solution of dextrose intravenously. This was followed by a chill and a temperature of 102 F. The patient refused food, and despite the administration of 125 cc. of the cortical hormone she grew steadily weaker. On the sixty-seventh day in the hospital, the temperature rose to 104.5 F., the carbon dioxide combining power dropped to 14.5 per cent by volume, and acetone bodies were found in the urine; the value for blood urea was not elevated. Death occurred twelve hours after these observations had been made. The patient had received a total of 500 cc. of the cortical hormone while in the hospital.

Necropsy revealed an old tuberculous process in the apexes of the lungs with some edema and congestion. There was marked atrophy of both suprarenal glands and of the thyroid gland. The heart weighed only 230 Gm.

We have seen an additional case not counted as one of the twenty included here, in which the diagnosis of Addison's disease was doubtful and in which there was striking improvement from the initial course of injections of the cortical hormone, but in which subsequent treatment was without beneficial effect. This patient died with symptoms of an intracerebral lesion, but necropsy was not permitted and the exact diagnosis could not be established. The results in this group indicate that the cortical hormone is not invariably effective in the treatment of Addison's disease. The diagnosis in case 1 had been made by the family physician. The patient was brought to the clinic by appointment, was taken directly to the hospital, and treatment with the cortical hormone was instituted immediately. This experience would at first appear to be in striking contrast to the experiments of Swingle and Pfiffner, who found that suprarenalectomized animals, prostrate and on the verge of death from suprarenal insufficiency, can be restored to normal health by treatment with the cortical hormone. Bilateral suprarenalectomy in experimental animals produces acute suprarenal insufficiency in an animal with normal reserves of strength and a previously unimpaired vitality. The conditions for recovery of the patient with Addison's disease are very different, for the latter suffers from a chronic ailment characterized by marked exhaustion and greatly reduced vitality. The recuperative power may well be greatly reduced under these conditions, and it is not surprising that treatment may occasionally be without avail. Swingle has also noted that if treatment is postponed unduly in experimental animals it likewise becomes more difficult.

GROUP 2.—The two patients in this group were in a moribund condition and died before adequate treatment could be administered.

CASE 2 (the thirteenth case in our experience; not reported before).—A farmer, aged 53, was brought to the clinic, Feb. 21, 1931, in a state of collapse. There was no history of exposure to tuberculosis. He had had influenza followed by pneumonia in 1918 but apparently had recovered completely. He had been working in the harvest field the summer of 1927, when he had suddenly collapsed. This attack had been called sunstroke, but recovery had been exceedingly slow and he never had been able to do his ordinary work thereafter. Weakness and fatigue had increased progressively. All his teeth had been extracted because of pyorrhea; he had been very sick for two weeks afterward and had not received benefit from this procedure. The weight had fallen from 240 to 175 pounds (from 109 to 79 Kg.) since 1927, and his skin had become much darker. The systolic blood pressure was reported as never having been greater than 96 mm. during this period. Three weeks before he came to the clinic, he had received an osteopathic treatment. He had been much exhausted by this treatment and had failed progressively thereafter. He had been in bed, unable to sit up or to take food without vomiting, and the pulse had been almost imperceptible.

He was admitted to the hospital in a comatose state. He was markedly dehydrated. There was marked diffuse brownish pigmentation over the face, neck and nipples, around the genitalia and in the axillae, and moderate pigmentation of the buccal mucous membrane. There were scattered black freckles over the back and arms. There was a small adenoma in the left lobe of the thyroid gland. The pulse and blood pressure were not perceptible. The heart sounds were regular but distant. The abdomen was sunken.

An attempt was made to treat the collapse and dehydration by giving 1,000 cc. of solution of dextrose, 10 per cent, and sodium chloride, 1 per cent, intravenously, together with 20 cc. of cortical hormone. The patient did not rally, and died eight hours after admission to the hospital. Necropsy revealed advanced bilateral tuberculosis of both suprarenal glands.

The available supply of cortical hormone was only 40 cc., and there were three other patients in the hospital awaiting treatment at the time. This patient was given all that could be spared, 20 cc., without apparent effect.

CASE 3 (the sixteenth case in our experience).—This patient came to the hospital in a serious clinical condition. He was given 30 cc. of the cortical hormone over a period of three days, with satisfactory clinical response. Further supplies of the hormone were not available for a period of three weeks, and another form of suprarenal therapy was tried without improvement. The patient became progressively weaker, vomited a little and went into collapse. At this time an additional shipment of cortical hormone was received from Swingle and Pfiffner, and 60 cc. was given without effect. Necropsy disclosed bilateral caseation of the suprarenal glands, with almost complete destruction of them.

These two patients did not respond to treatment; yet in neither case was it possible to make adequate trial of the therapeutic effects of the cortical hormone.

GROUP 3.—The five patients in this group made a partial response to treatment while at the clinic but have required nearly continuous treatment with the cortical hormone following their dismissal.

CASE 4 (the tenth case in our experience; not reported before).—A policeman, aged 45, came to the clinic with a typical history of Addison's disease of three years' duration. Four of his relatives had died of pulmonary tuberculosis, and the patient himself had had pleurisy with effusion in 1924. For the last six months he had been unable to work on account of dyspnea, weakness and failing memory.

General examination disclosed that the patient was poorly nourished and had diffuse brownish pigmentation of the skin.

There were increased mottling and freckling on the exposed surfaces and a great deal of pigmentation around the lips and mouth. The tonsils were infected. The systolic blood pressure was 100 and the diastolic 70 in millimeters of mercury. The remaining examination gave essentially negative results. The urine was normal. The proportion of eosinophils in the differential blood count was from 25 to 35 per cent. There was no demonstrable pulmonary lesion. Roentgenograms of the suprarenal regions contained the shadows of well marked bilateral calcified lesions. The basal metabolic rate was normal.

The patient was given 75 cc. of cortical hormone intravenously, with general improvement in symptoms and lessening of pigmentation, although this was not as striking as in some cases. Nineteen days after admission, when he was preparing to go home, slight sore throat developed. The next day he had a chill, and the temperature rose steadily in two days to 104.2 F. He was delirious, was greatly prostrated, and signs of meningeal irritation were marked. He was coughing up bloody sputum, and examination disclosed well developed bronchopneumonia, which was confirmed by roentgenograms. The pharynx was acutely inflamed, the tonsils almost meeting in the median line. He was given daily injections of cortical hormone; in all, 85 cc. over a period of six days. In cultures from the throat and sputum were Streptococcus mitior (viridans) and Streptococcus hemolyticus.

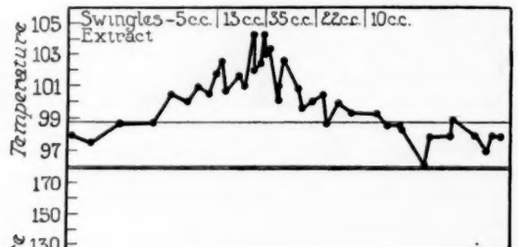

Chart 1.—Temperature and pulse in case 4 (the tenth case in our experience) in the course of acute streptococcal sore throat treated with cortical hormone.

On the sixth day after the beginning of infection, all symptoms had disappeared, the temperature was normal, and the patient felt so well that he wanted to get up. The pigmentation had almost disappeared. So rapid a recovery from severe respiratory infection would be noteworthy in an otherwise healthy person. It is all the more so in a case of severe Addison's disease, for the susceptibility of the latter to intercurrent infection is well known. We feel that recovery would not have been possible without the use of the cortical hormone.

This patient has remained well since dismissal from the clinic but has required injection of 5 to 10 cc. of cortical hormone once or twice a week.

CASE 5 (the second case in our experience; reported before).—This patient has been in fairly good condition since leaving the clinic, but his condition has necessitated frequent injections of the cortical hormone, and he has been unable to go back to work.

CASES 6, 7 and 8 (the eighth, eleventh and seventeenth cases in our experience; neither reported before).—These cases showed the same general type of response to treatment as the two preceding ones.

Such cases are very unsatisfactory from the standpoint of treatment, for while the treatment to date has apparently been life saving, it has not been possible to rehabilitate the patient. Whether further improvement could be produced by daily injection of considerable amounts of cortical hormone is a question which we have not been able to answer with the present limited supply.

GROUP 4.—This group is composed of cases in which there was excellent response to treatment while the patients were at the clinic. However, they did not continue treatment at home and died in crisis without a further adequate course of treatment with the cortical hormone. There are three cases in the group.

CASE 9 (the first case in our experience; reported before).—This patient was dismissed from the hospital, July 16, 1930. On his dismissal he was given a small supply of the hormone, which was administered by his physician at home. He did well for a little while; then he failed, and finally he went into coma, and died, November 11. The family had been warned as to the serious nature of his condition and had been advised to write for a further supply of the cortical hormone if the patient did not do well. We were not notified of his condition, however, and he had not had the hormone in the six weeks preceding his death.

CASE 10 (the sixth case in our experience; reported before).—This patient was dismissed from the clinic, Oct. 16, 1930. His trip home was uneventful. Twenty-five cubic centimeters of the hormone was administered by his physician at home from October 21 to October 26. During this period he was in good condition. November 10, he began to fail; he lost his appetite, and nausea and marked prostration developed. A further supply of the hormone was sent, November 25, but proved to be wholly ineffective. There was no improvement in the patient's condition; he continued to fail, and he died, Decmeber 2. Word was received at the same time, from Dr. Swingle, that the batch of hormone of which a portion had been sent to this patient, November 25, had been tested on animals and had been found to be wholly without action.

CASE 11 (the third case in our experience; reported before).—This case was similar to the two preceding cases.

These three patients responded well to treatment while they were at the clinic. It was not possible at the time to continue the treatment with the cortical hormone indefinitely after the patients left the clinic, and death in each case occurred several weeks after they had been dismissed from observation. These deaths, therefore, are evidence of the need for continued treatment with the cortical hormone rather than of its failure as a therapeutic agent. The cases occurred early in the series when the supply of hormone was most limited and irregular. In each case death was apparently preceded by a period of decline and gradual clinical failure. Treatment with the cortical hormone during this period possibly would have had as dramatic an effect as when first used on these patients. However, these three cases emphasize the importance of continuous medical supervision of patients with Addison's disease, in order, if possible, to anticipate rather than to relieve the period of crisis.

GROUP 5.—The nine patients in this group made good response to treatment while they were at the clinic and have done well since dismissal.

CASE 12 (the ninth case in our experience; not reported before).—A farmer, aged 20, was admitted, Dec. 31, 1930, complaining of weakness and discoloration of the skin. He had been exposed to tuberculosis between 1925 and 1928. He remembered having tried to whiten his skin in 1925 by the use of lemon juice because it was a "dirty brown color." In August, 1928, he had noticed that his skin was unusually pigmented, but he had thought this to be due to sunburn. He had been doing heavy manual labor at this time. Within the next month he had noticed marked diminution in strength. He had been able to continue his work, but when he returned to school he had become progressively more tired and weak and had noticed that his summer tan had not faded. In spite of a

ravenous appetite, he had not gained in weight. He had been increasingly tired, and although he had slept thirteen hours a day he had been sleepy and tired after 3 p. m. He had managed to take part in sports and had passed his examinations in the spring. The summer of 1929, his symptoms had increased. At this season a craving for salt and for olives had developed. In July, 1929, he had become seriously ill with tachycardia, anorexia, vomiting and constipation. He had been prostrated, and said that he "went out of his mind." His physician at that time had made a diagnosis of Addison's disease and pulmonary tuberculosis. He was able to return to school in the autumn. In February, October and December of 1930 he had had periods of great prostration. At times he had been too weak to sit up in bed. In the last exacerbation he had lost 15 pounds (6.8 Kg.). The illness throughout had been characterized by exacerbation and recession of symptoms. Even the pigmentation had varied considerably from time to time. His beard was scanty, and he had to shave only once in two weeks.

The patient appeared to be exhausted. His skin was light olive and there were darker, mottled areas on the exposed surfaces, the pelvic girdle and the extensor aspects of the arms. The nipples were almost black, and the genitalia and anus were deeply pigmented. There were a few scattered freckles and some pigmented areas on the palms of the hands, soles of the feet and buccal mucous membrane. The skin was smooth, unwrinkled and silky. There was moderate tonsillar and dental sepsis. The heart was of normal size, but the sounds were faint. The pulse was regular, soft and at times almost imperceptible. Blood pressure was 82 systolic and 60 diastolic. There were signs of increased density in the upper lobe of the right lung. External hemorrhoids were present. Roentgenograms disclosed evidence of bilateral calcification in the suprarenal region and of old tuberculous infection of the upper lobe of the right lung. The urine contained many hyaline casts but was otherwise negative to examination. There was slight leukocytosis. The result of the Wassermann test of the blood was negative.

The second day after his admission, the patient was drowsy. He was weaker, nauseated, unable to eat, and his pulse was almost imperceptible. Treatment was started, the cortical hormone being used. Sixty cubic centimeters was given for a period of five days. His improvement was immediate, beginning on the first day and progressing with each succeeding day. At the conclusion of the course of injections he stated that he felt in perfect health, and the pigmentation had decreased approximately 50 per cent. The trip to his home was made without difficulty. A month later he reported that he was able to walk five miles without fatigue, had had two teeth extracted without any untoward reaction, and had gained 17 pounds (7.7 Kg.). Since then he has had two periods marked by weakness and loss of strength. Cortical hormone was administered by his home physician, with rapid improvement each time. He now writes that he is able to walk six miles a day and plans to return to school in the autumn.

CASE 13 (the twelfth case in our experience; not reported before).—A division engineer, aged 43, was admitted to the hospital because of weakness, shortness of breath, loss of appetite, and morning nausea. He had been in good health until 1921, ten years before his admission. It had then been observed by members of the family that the skin of his face was becoming a yellowish tan. He had felt perfectly well but had consulted a physician because of the pigmentation. Scattered dark brown freckles had appeared over the face and hands. Not until five years after the pigment of the skin had been noticed had the patient begun to complain of dyspnea and of fatigue on exertion. The color of the skin had become gradually darker. In 1926 he had consulted a physician, who had made a diagnosis of Addison's disease and had instituted treatment with an extract of the whole suprarenal gland and with thyroid extract. This had been continued until 1928, when another physician had confirmed the diagnosis but had advised discontinuing the taking of thyroid extract. The patient had continued to take suprarenal extract until he had come to the clinic. While he had been receiving treatment this man had had at least one attack of what he termed "grip" each year. These attacks had lasted from three to seven days and had consisted of head colds, malaise, backache and fever. In November, 1930, he had experienced his first severe break in health, which had been marked by nausea, vomiting, anorexia, dyspnea and prostration, and had been attributed to possible food poisoning. He had remained in bed five days and had returned to his work in two weeks. In January, 1931, he had contracted a severe head cold, which had been attended by a profuse nasal discharge, a sense of tightness in the thorax, and a temperature of 102 F. for from three to four days. This apparently had initiated a second gastro-intestinal upset, with nausea, vomiting, dyspnea, and prostration for one week. It was at this time that the patient had read a newspaper clipping which mentioned the treatment of Addison's disease with the cortical hormone prepared by Swingle and Pfiffner. He had consulted his physician, who had advised him to go to the clinic for treatment.

At the time of examination there were a few scattered black freckles over the face and hands, but the pigmentation was diffuse over the entire body. The gums were spotted with small black areas, but the entire buccal mucous membrane was diffusely pigmented. General and roentgenologic examination of the thorax disclosed signs of partial collapse of the lower lobe of the left lung. The heart sounds were faint. The pulse rate was 70 beats a minute. The systolic blood pressure was 76 and the diastolic 50. The abdomen appeared to be normal on palpation. Roentgenograms of the suprarenal region were negative for calcification. Urinalysis gave negative results. The Wassermann reaction of the blood was negative. The basal metabolic rate on two occasions was —27 and —30 per cent. Over a period of five days, 60 cc. of cortical hormone was given. Improvement was marked within a few days. The patient felt stronger, ate more and had much less fatigue; constipation disappeared, and his color became lighter. The basal metabolic rate rose to —13 per cent ten days after he started treatment. This improvement continued, and at the time of his dismissal he had gained a total of 17 pounds (7.7 Kg.). He has been on the Muirhead treatment and has required only two additional courses of treatment since his return home. He has felt well and has been able to work regularly.

CASE 14 (the fourteenth case in our experience; not reported before).—An aviator, aged 26, was admitted to the clinic, February 16, with a complaint of weakness and dyspnea on exertion. He dated the onset of these symptoms back ten years, at which time he had been unable to play a complete game of basketball, because of exhaustion. This inability to keep up with other lads had become more marked in the year before we saw him, so that walking up stairs or parking a car was an effort. It had been observed in the last year that he was "tanned" all over. Black freckles had appeared and disappeared over the body. Seven months before his admission he had experienced an attack of violent vomiting, with diarrhea, abdominal cramps, nausea and anorexia. This had lasted for a few days and had been attributed to food poisoning. Since this time he had had several similar attacks, each coming after a shorter interval than the one before and lasting longer than the preceding one. He had lost from 20 to 25 pounds (9 to 11.3 Kg.) in six months and had had definitely to restrict his activity because of dyspnea and a sense of fatigue. He had remarked a definite craving for salt in his diet. Six months before he appeared at the clinic he had successfully completed his air service examination, with an altitude rating of 19,000 feet.

Examination revealed that the patient was well developed, had a diffuse olive-tan pigmentation over the entire body, with a deeper brown coloring of the nipples, genital organs, axillae and a scar made at appendectomy. Pigmentation of the mucous membranes of the mouth could not be found. Numerous scattered brown and black freckles were present over the face and arms, and a small area of brown pigmentation was seen in the sclera of the right eye. There was no clinical evidence of active tuberculosis. The heart was small and the sounds were rather faint. The edge of the liver was just palpable. There were no abnormal abdominal masses. Both testes were about half normal size. The deep reflexes were normal. Laboratory studies showed the urine to be normal. Excretion of phenolsulphonphthalein was normal. The serologic test for syphilis gave a negative result and the blood count and blood chemical determinations were within normal limits. The

basal metabolic rate ranged from —1 to —10 per cent. A sugar tolerance test showed a normal condition. Roentgenograms of the thorax were negative. Roentgenograms of the suprarenal regions showed nothing on the left, but there was a small area of increased density suggestive of calcification on the right.

After a period of preliminary study in the hospital, 70 cc. of cortical hormone was given in divided doses in the course of a week. There was marked improvement in the patient's appetite; his intake of food increased from 1,800 to 4,400 calories and there was an associated gain from a weight of 125 to 134 pounds (56.7 to 60.8 Kg.). There was also improvement in strength, a feeling of well being, and disappearance of constipation. During a period of six weeks without treatment there was gradual loss of strength, and the weight fell back to 129 pounds (58.5 Kg.). The patient had much difficulty with constipation and became prostrated. Further supplies of the hormone again became available. He was given 60 cc. in the course of the next five days, and improvement was more striking than the first time. He was up and around, and played thirty-six holes of golf without difficulty. He gained to 142 pounds (64.4 Kg.). Between April 10 and April 19 he was given an additional 90 cc. of hormone. There were no distinct effects from overdosage. He was perhaps a little more restless and apprehensive, and apparently abnormally sensitive to heat, although there was no fever. There was no change in the basal metabolic rate. He noticed that he had to shave daily when formerly he had shaved only three times a week. Ten days later his appetite was not quite so acute, his bowels moved less regularly, and he ceased to gain in weight. He was given an additional 30 cc. of hormone to protect him against the fatigue of the journey to Seattle and was dismissed from the clinic, April 28. At that time he was advised to take suprarenal cortex, 5 grains (0.3 Gm.), three times a day by mouth. The trip to Seattle was made without incident, and he has been in fairly satisfactory clinical condition since then. He has, however, required two or three small doses of hormone each week to maintain his activity.

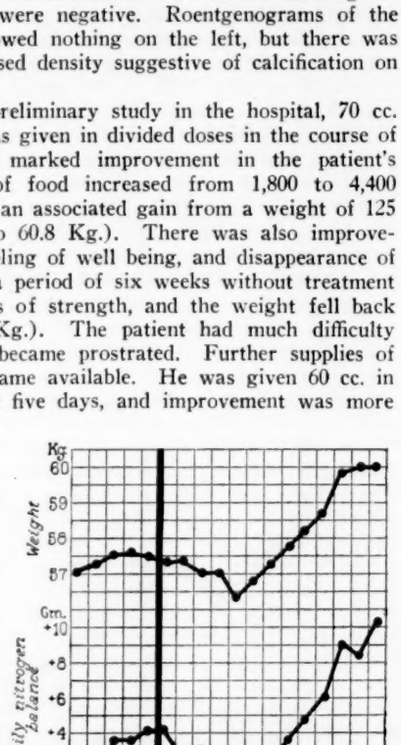

Chart 2.—Changes in weight, nitrogen balance, basal metabolic rate and blood pressure in case 14 (also the fourteenth case in our experience), in consequence of treatment with the cortical hormone.

The effect of treatment on the weight, the nitrogen balance, the basal metabolic rate and the blood pressure in this case [5] are shown in chart 2.

CASES 15, 16, 17, 18, 19 and 20 (respectively the fourth, fifth and seventh cases of our experience, reported before, and the eighteenth, nineteenth and twentieth cases of our experience, not reported before).—These cases were similar to the cases represented in the three reports with which group 5 opens.

An additional case that could be included in this group was treated in London by Dr. Simpson [6] and has been reported by him separately. Because of the limited supply of cortical hormone, these patients have had to depend on the Muirhead treatment or on the administration of suprarenal cortex by mouth for the greater part of the time. When this has not been entirely sufficient, it has been possible to avoid serious disturbances by administration of small amounts (from 30 to 40 cc.) of the cortical hormone at irregular intervals. The efficiency of these patients is low; they have had to curtail their activities, yet they have been able to carry on their ordinary daily life without undue restraint.

THE USE OF CORTICAL HORMONE IN CONDITIONS OTHER THAN ADDISON'S DISEASE

The cortical hormone, besides being used in the treatment of Addison's disease, has been tried in the treatment of an equal number of patients suffering from a variety of diseases. In collaboration with H. S. Plummer, W. A. Plummer and S. F. Haines, four cases of exophthalmic goiter and one case of myxedema have been studied. There was no change in the case of myxedema. Subjective evidence of improvement was reported by two of the four patients with exophthalmic goiter. Objectively there was a less stimulated state, some decrease in the pulse rate, and decrease in the basal metabolic rate from + 60 to + 30 per cent in one case and from + 55 to + 28 per cent in the other. In the other two cases there were no definite changes. From a practical point of view, these results were of no consequence, for it was subsequently necessary to give these patients compound solution of iodine, after which thyroidectomy was performed. The results are of considerable physiologic interest and emphasize the need, pointed out by Marine,[7] for further study of the interrelationship of the activities of the suprarenal and thyroid glands.

Six cases of anorexia nervosa have been studied. There was some increase in appetite or in the ability to take food in two cases. Whether this is of significance remains to be determined. In five cases of asthenia associated with neurasthenia or psychoneurosis, treatment was given with negative results. Likewise, no effect was observed in single cases of myasthenia gravis, diffuse myositis, postural hypotension or benign hypertension. For the most part, the results from the use of this extract in conditions other than Addison's disease have been disappointing. In fact, the apparent specificity of the effect has been such as to suggest that a therapeutic test, with definite response to the cortical hormone, would be of diagnostic value in a case of suspected Addison's disease.

DOSAGE AND METHODS OF ADMINISTRATION OF CORTICAL HORMONE

The dosage and methods of administration of the hormone are of extreme importance in any attempt at specific organotherapy. Swingle and Pfiffner have used as much as 1 cc. for each kilogram of body weight each day for suprarenalectomized cats. As 1 cc. of extract represents 30 Gm. of suprarenal cortex, or the entire supply from two steers, the relative dose in terms of the weight of cortical tissue is enormous. On the other hand, it must be remembered that the amount of active material present in the excised suprarenal

5. The results of the detailed study of the chemical and metabolic changes in Addison's disease and the effect of treatment with the cortical hormone on these changes are being reported separately (Greene, C. H.; Rowntree, L. G.; Swingle, W. W., and Pfiffner, J. J.: Metabolic Studies in Addison's Disease: the Effect of Treatment with the Cortical Hormone of the Suprarenal Gland, Am. J. M. Sc., to be published).

6. Simpson, S. L.: Addison's Disease Treated by Intravenous Cortical Extract, Proc. Roy. Soc. Med. **24**: 497-498 (Feb.) 1931.

7. Marine, David: Remarks on the Pathogenesis of Graves' Disease, Am. J. M. Sc. **180**: 767-772 (Dec.) 1930.

gland bears no definite relationship to the total normal daily output of the actively secreting gland.

To give the patient with Addison's disease a dose of cortical hormone comparable to those used for animals would require from 60 to 90 cc. a day. This dosage has been obviously impracticable with the limited supply which has been available for clinical use. We have given as much as 20 cc. intravenously at one time and a total of 40 cc. in one day with no untoward effects. A course of treatment usually has consisted of the administration of from 40 to 60 cc. over a period of from four to ten days. One patient (case 1 in this paper, the fifteenth case in our experience) received 500 cc. within two months. The effects of treatment are usually apparent within from twenty-four to seventy-two hours. The maximal effect has usually been noted over a period of from five to seven days after stopping treatment. In the more severe cases, in which patients are unable to maintain strength and activity on the Muirhead treatment, a falling off of appetite, strength and weight is noted from seven to fourteen days after stopping the injection of the cortical hormone. Serious symptoms of suprarenal insufficiency, however, may not appear until several days or weeks later. Those patients who are so seriously ill as to need continuous treatment with the cortical hormone vary in their requirement, but usually have been given from 3 to 10 cc. a day. On the other hand, patients who are able to maintain partially reduced or normal activity with the aid of the Muirhead treatment require treatment with the cortical hormone only at intervals to combat the effects of intercurrent infection, excessive fatigue or similar deleterious influences. From the clinical standpoint, complete suprarenal insufficiency is probably rare in cases of Addison's disease. Treatment, therefore, must provide not for complete replacement but only for a supply of cortical hormone necessary to make up for the difference between the daily requirement of the patient and that supplied by the patient's own glands. As with the insulin requirement of patients who have diabetes, the amount of hormone necessary for different patients and for the same patient at different times will vary.

We have found the cortical hormone too irritating for subcutaneous injection. Certain patients tolerate it well by intramuscular injection and this is perhaps the method of choice for these patients. We have had no untoward effects from the intravenous injection of the hormone in quantity. This is undoubtedly the method of choice when the patient is in crisis and an immediate response is necessary. It is also the method of choice in hypersensitive patients who do not tolerate the slight pain associated with intramuscular injection. There have been no reactions when the hormone has been injected slowly into a large vein. If it is injected too rapidly there occasionally is a slight burning sensation along the course of the vein. A change in speed of injection, or dilution with saline or dextrose solution, obviates this. During the injections the patients frequently note a taste and smell as of garlic, onions or kerosene, but this disappears within a few seconds.

GENERAL COMMENT

The clinical changes detected in observation of patients who respond satisfactorily to treatment with the cortical hormone are: (1) disappearance of anorexia, nausea and vomiting, and reappearance of appetite and development of the sense of hunger; (2) relief from fatigue and increase in strength and endurance; (3) disappearance of pain, and improvement in sleep; (4) decrease in pigmentation; (5) gain in weight; (6) return of normal gastro-intestinal activity; (7) change in the mental attitude characterized by hope and euphoria; (8) moderate increase in blood pressure when the patient is in crisis or shock but very little change when the patient is in good condition; (9) increased resistance to infection or to the effects of surgical procedure, and (10) partial or complete rehabilitation of the patient and return to work.

The most constant and striking effect is the disappearance of anorexia, nausea and vomiting, and also of the distressing pain in the loins that is present in so many of these patients. Increase in strength and endurance appears early, is marked, and is out of all proportion to the objective observations. The decrease in pigmentation becomes apparent within three or four days.

A new problem is in the offing. With other methods of treatment the patients have been content to remain invalids, but the physical and mental improvement following the administration of the cortical hormone has led, in many instances, to the requests to return to work. Because of the inadequate supply of the hormone and also because of lack of knowledge as to the permanence of the effect, these requests have been denied thus far.

Changes in Weight (Pounds)

Case	Days Under Treatment	Minimum	On Dismissal	Gain
1	..	108	117	9
2	42	119	128	9
3	6	151	154	3
4	5	126	128	2
5	3	118	119	1
7	30	115	122	7
8	24	136	137	1
9	35	119	132	13
10	31	108	114	6
11	34	119	123	4
12	30	108	128	20
14	70	125	142	17
15	68	111	107	—4
17	63	113	120	7
18	9	123	123	..
19	15	151	153	2

In one instance we have observed a patient under treatment with the cortical hormone pass through an infection which we have every reason to believe would have been immediately fatal in the absence of treatment.

A tooth was removed without difficulty from one of our patients. This will bring to the fore the question of surgical procedure in Addison's disease for the removal of diseased glands. So far as we know, surgical removal of a diseased suprarenal gland has been performed but once in the history of medicine.

Idiosyncrasies to drugs constitute a serious clinical problem in Addison's disease. In the old days, if a patient was given a purgative he might go into collapse and die. The administration of almost any drug was attended with uncertainty as to its action. Once the patient is under the influence of the cortical hormone, we are of the opinion that the response to drugs will be much more normal than has been true in times past.

The gain in weight of thirteen of the patients treated is indicated in the table. It must be remembered that some were in the hospital for short periods, whereas others remained for a period of a month or six weeks. The majority of the patients gained weight, and some did so in a very striking manner. Three gained 10 pounds (4.5 Kg.) or more in the course of a month. Associated with the gain in weight there is a cor-

responding shift in the nitrogen balance with nitrogen retention, as shown in chart 2.

Swingle and Pfiffner will be unable to furnish further supplies of cortical hormone of their own manufacture for clinical use or to standardize preparations made commercially. This, then, constitutes a final report on the immediate results obtained with the preparation of the cortical hormone made by Swingle and Pfiffner. The experience of the last year has established beyond question the activity and the clinical usefulness of this preparation in the treatment of patients with Addison's disease. As such, it marks the close of the experimental phase in the clinical use of this preparation. Efforts are being made, by means of the methods of Swingle and Pfiffner, to prepare on a commercial scale an active, standardized preparation of this hormone that will be acceptable to the Council on Pharmacy and Chemistry of the American Medical Association. When this has been done, a new and specific agent of value in organotherapy will have been placed in the hands of physicians.

ABSTRACT OF DISCUSSION

DR. ROY G. HOSKINS, Boston: One fundamental question is where we now stand in the suprarenal problem. By and large the evolution of our knowledge of hormones goes through a somewhat similar course in each instance. First of all, historically, the important thing was the discovery that the suprarenals are necessary to life and that they play an important part in bodily activities. The credit for this goes to a large extent to Addison. That left us with the question, Which part of the suprarenal is essential to life? Much difficult work was required to establish the fact that it is the cortex that is indispensable. The next problem was whether the cortex functions by addition or by subtraction. The weight of opinion for a good many years was that the suprarenal is a detoxicating organ. It was thought to function not by adding anything to the blood stream but by removing something. That problem was answered in favor of addition. The cortex adds something to the blood stream. The next problem was to get this elusive something. Dr. Swingle's share in that he has already modestly referred to. Hope of solution appeared several years ago. Goldzieher and Aub reported promising results. Then Hartman and Rogoff as well as Swingle independently evolved extracts of proved potency. The next problem is the chemical nature of the hormone. The final important step will be its synthesis. May I ask what is the minimal dose that has so far proved efficacious? Second, is the extract effective in hyposuprarenalemia? I am interested in that problem on account of my work in dementia praecox. I find in that psychosis a picture which theoretically could be produced by a fairly high grade of suprarenal deficiency. I have entertained hope that when this hormone became available I might do something significant for these patients. Dementia praecox is a disorder that fills one fifth of all hospital beds in this country. A substance that would be useful in that psychosis would be of tremendous value.

DR. CLAYTON W. GREENE, Buffalo: Through association with Dr. Hartman in Buffalo, I have had experience in the treatment of suprarenal disease, particularly Addison's disease. At the same time during which Dr. Swingle and Dr. Pfiffner were working, Dr. Hartman was working, and almost simultaneously these two groups have apparently produced similar extracts independently and by somewhat different methods. About a year ago I had under my observation at the Buffalo General Hospital two cases of Addison's disease. First, a man with complete collapse who was given cortical extract and after a short time responded, just as have the cases presented here today. A few days later a woman was admitted in a similar crisis. Comparatively little extract was available and this was divided between them. The first patient suffered a relapse; the second died. Fortunately, more extract soon came through and the man improved. He attained reasonable health and on one or two occasions went home, where he administered the extract to himself. Through reduction of extract or through omitting it, he experienced four relapses, from each of which excepting the last he recovered his former state of reasonable health with the use of the cortical extract which Dr. Hartman calls cortin. The last relapse was fatal because, as has been pointed out, these patients are quite susceptible to infection and this man developed, from a seemingly insignificant coryza, a bronchopneumonia which was found at autopsy. Each of these cases showed at autopsy complete simple atrophy of the cortical tissue, and in neither was active tuberculosis discovered anywhere. Since then we have had several cases under treatment. At present there are three in the hospital, one mild, one severe, and one perhaps in between. The patients have responded very well to the cortin. We have had a total of six patients who have responded well to the extract, excepting the two first mentioned, and there have been three patients using cortin at the Massachusetts General Hospital in Boston. I am sorry that I cannot speak of Dr. Swingle's extract because none has been available for us. Both of these investigators have done an inestimable service in producing something to combat Addison's disease. Our observations, both laboratory and clinical, have been essentially the same as those presented today in the experimental animal by Dr. Swingle and in patients by Dr. Carl Greene.

DR. W. L. AYCOCK, Boston: It seems to me that one of the functions of the internal secretions might be that of regulators to keep bodily physiology in tune with a varying environment. This, I think, was shown years ago by the work of Reid Hunt and Sidell and Finger on seasonal variations in the iodine content of the thyroid. It occurred to me that Dr. Swingle might have had an opportunity in the course of his work to determine the amount of cortical extract necessary to keep a suprarenalectomized animal in a normal state of metabolism at different seasons of the year. Would this not give one further indication as to what the function of this particular extract is in the normal body? I should like to ask whether he has noted any seasonal variations in the suprarenalectomized animals. I am interested in this point because it has been noted that certain infectious diseases vary with season and climate in much the same manner as some of the glands of internal secretion, suggesting, I think, the possibility that some abnormality in internal secretion may play a part in susceptibility to certain infectious diseases.

DR. E. P. MCCULLAGH, Cleveland: My experience in the treatment of Addison's disease with the newer hormones has been extremely limited. Roy McCullagh, my brother, made for us in his laboratory an extract of the suprarenal cortex by the method described by Dr. Swingle. He also made extracts by the method described by Dr. Hartman. He felt from testing the extracts made that the extract made by the Swingle-Pfiffner method was more active. At first there was difficulty in obtaining extracts which were uniformly potent. Some of the extracts seemed to be impotent. We found considerable difficulty in that it takes a great deal of gland to produce a small quantity of the extract, and to test it thoroughly used up practically all the extract we had in each case, so none was left for patients. Finally, however, we made up quite a few samples, put them together in one lot and I have treated just one patient with definite Addison's disease who had pigmentation, low blood pressure, muscular pains, asthenia, nausea and so on. The actual treatment was preceded by ten days of intravenous injection of physiologic solution of sodium chloride without improvement. For ten days this patient then received 10 cc. a day of the cortical hormone and there was definite improvement, with a slight rise in blood pressure. The muscular pains disappeared, strength was greatly increased, and nausea and vomiting disappeared.

DR. ROBERT L. LEVY, New York: I want to call attention to the effects on blood pressure which have been described, particularly in the clinical cases. Although these patients showed marked symptomatic improvement, the blood pressure remained at a relatively low level. This affords further evidence of the complex mechanisms concerned in the regulation of arterial tension.

DR. J. J. PFIFFNER, Princeton, N. J.: It has been my lot during the last few years to wrestle with the problem of the chemical preparation of this material, and all I can say is that we have obtained an active preparation. I regret, of course, as does every one else, that we do not get a gram of material

where we actually get a milligram, but that happens to be the case.

DR. W. W. SWINGLE, Princeton, N. J.: With regard to the question about variations in the material throughout different periods of the year, all we can say is that we have prepared this material for something over two years now and get the glands in regularly, and so far as our tests go on animals there seems to be more or less uniformity. I do not believe that we have found much variation in potency in extracts prepared in the laboratory. Of course, our business is to bring the cats back from prostration, and keep them going. We find that the extracts are more or less uniform in their activity in this respect. We put the animal on a minimum dose—a cat will take a fourth or a sixth of a cubic centimeter a day and maintain a perfectly normal condition—and the extracts are changed at frequent intervals. We make up a small amount of extract at a time, different samples being made at different times of the year and the potency seems to be about the same. Whether there is or is not a seasonal variation in the amount of hormone found in the cortex, I am unable to say. I know that the thyroid does vary in its activity with the season and it may well be that the suprarenal likewise shows variation. Our investigations to date really do not cover this point adequately.

DR. L. G. ROWNTREE, Rochester, Minn.: I will say without the slightest hesitation and after an extensive experience and a long interest in the subject that the cortical hormone is considered by all of us the most effective remedy in the management of Addison's disease. I want to compliment Drs. Swingle and Pfiffner on their judgment. With all possible methods that could have been used and are being suggested everywhere for standardization of the product, they took the only one, I believe, that is a true criterion at present; that is, life survival after the removal of the suprarenals and the administration of the product. It was excellent judgment as well as chemical skill that brought success.

THE BIOCHEMICAL STUDY OF SINUS DISEASE *

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AND
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Our purpose in this study was to determine any changes that might be present in the blood, pus, tissue or bone wall of diseased sinuses, more especially in chronic sinus disease. It was hoped by this investigation to reveal, through the biochemical observations, information which would be of importance pertaining to the diagnosis, prognosis and treatment. It was thought also that it might be the means of determining the extent of involvement and chronicity.

In this study, only patients with definite and unmistakable evidence of a sinus disease were selected. The examination of the patients consisted of the history, rhinoscopic examination, roentgenograms of sinuses, and, when indicated, resort to direct irrigation of the sinus, chemical analysis of the blood, Kahn and Wassermann tests, and urinalyses. The patients were from 4 to 64 years of age. The Caldwell-Luc operation was utilized in the radical cases when the maxillary sinus was opened. The external operation was employed with reference to the frontal and ethmoid sinuses. A sufficient quantity of the bony wall of the sinuses was removed, likewise the tissue contents of the sinuses. Pus, when found, was aspirated into a sterile syringe. The blood was withdrawn from a vein in the arm in the usual manner.

The chemical analysis of the blood consisted of a study of forty-eight patients. Free pus, obtainable without contamination, has not always been available, even at the time of operation, and it is our belief that this part of the material has not been sufficient to permit any final conclusion, with reference to chemical observations that might be of significance. Many factors have suggested themselves since this problem has been undertaken and will obviously make necessary further observation, thereby placing this presentation in the nature of a preliminary report.

For the analysis of the bone tissue, the method of Shear and Kramer [1] was used. Immediately after dissection, the bones were placed in alcohol and transferred to the laboratory. Any adhering soft tissue was removed and the bones were crushed and extracted with an equal mixture of alcohol and ether in a Soxhlet apparatus for about four hours, the bone being rendered pus free. The bones were then dried in an oven at a temperature not exceeding 40 C. for a period of about eight hours. The dried bone powder was then pulverized again and placed in a desiccator over concentrated sulphuric acid.

For the calcium and phosphorus determinations, a 25 mg. sample was weighed out on a microbalance capable of weighing to 0.05 mg., a piece of lead foil being used instead of weighing paper as suggested by Shear and Kramer.[1] The sample was then transferred to a 25 cc. volumetric flask and digested with 5 cc. of molar hydrochloric acid in a boiling water bath for ten minutes. When the mixture was cool, 7.5 cc. of a 20 per cent trichloracetic acid solution was then added, and the volume was made up to 25 cc. with distilled water. The solution was then filtered through the best grade of ashless quantitative filter paper.

The bone calcium determinations were made on this filtrate according to the method of Kramer and Tisdall [2] and were checked by the method of Roe and Kahn.[3] Identical results were obtained by the two methods used. The bone phosphorus determinations were made by the method of Fiske and Subbarow,[4] and were checked by the method of Briggs, Bell and Doisy.[5] Here, likewise, the two methods checked each other closely. All these methods are well known standard methods used in chemical analysis of the blood, which, with suitable modifications as given by Shear and Kramer,[1] are used in the analysis of the bone.

Bone carbonate (carbon dioxide) was determined according to the method of Kramer and Howland,[6] the Van Slyke [7] microvolumetric blood carbon dioxide apparatus being used. A 25 mg. sample of the powdered bone was placed in the cup of the apparatus and carefully washed into the calibrated stem with water. Five cubic centimeters of 4 normal sulphuric acid was allowed to enter the reaction chamber, and a vacuum was created by lowering the mercury level. The usual technic of making a plasma carbon dioxide determination with this instrument was followed.

The determination of nitrogen (protein) was made in the manner suggested by Koch and McMeekin.[8] A

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* From Rice Institute.

* Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. Shear, M. J., and Kramer, Benjamin: J. Biol. Chem. **79:** 105 (Sept.) 1928.
2. Kramer, Benjamin; and Tisdall, F. F., quoted by Clark, E. P., and Collip, J. B.: J. Biol. Chem. **63:** 461 (March) 1925.
3. Roe, J. H., and Kahn, B. S.: J. Biol. Chem. **81:** 1 (Jan.) 1929.
4. Fiske, C. H., and Subbarow, Yellapragada: J. Biol. Chem. **66:** 375 (Dec.) 1925.
5. Briggs, A. P.: J. Biol. Chem. **59:** 255 (March) 1924.
6. Kramer, Benjamin; and Howland, John: J. Biol. Chem. **68:** 711 (June) 1926.
7. Van Slyke, D. D., and Cullen, G. E.: J. Biol. Chem. **30:** 289 (June) 1917.
8. Koch, F. C., and McMeekin, L. J.: J. Am. Chem. Soc. **46:** 2066 (Sept.) 1924.

5 mg. sample of the bone powder was digested with sulphuric acid and 30 per cent hydrogen peroxide, then nesslerized and compared colorimetrically with a standard nitrogen solution. The percentage of nitrogen multiplied by the factor 6.25 gives the percentage of protein present in the bone powder.

The determination of calcium phosphorus and protein in the membranes was performed in exactly the same manner as is described for the bone. The carbonate determinations, however, were not made, since it was found that the tissue and other sinus material did not produce a measurable amount of carbon dioxide. All analyses were made on individually weighed duplicate samples of the sinus material and checked to within 0.7 per cent as a maximum variation in any single pair of duplicate analyses.

The chemical analyses of the blood were made according to the generally accepted methods: urea by the method of Leiboff,[9] uric acid by the method of Benedict,[10] chlorides by the method of Whitehorn,[11] sugar by the method of Folin and Wu,[12] serum calcium according to the Roe and Kahn method,[3] and serum phosphorus according to Fiske and Subbarow.[4] The urinalyses, blood counts and other qualitative analyses were made in the usual manner.

Without going into any lengthy discussion of the chemical composition of bone, it is sufficient for our purpose to accept the prevailing conception of the chemical composition of bone as being made up of calcium phosphate and calcium carbonate. The formula assigned to the compound present is 3 $Ca_3(PO_4)_2$. $CaCO_3$. This formula, therefore, places bone in a group of naturally occurring phosphate rocks known as the apatite group of minerals. Not only does chemical analysis of bone seem to substantiate this belief, but roentgenograms of bone and apatite rocks correspond nearly identically.[13] One who examines the formula for bone will note that some of the calcium is combined in the form of calcium carbonate and the remainder as calcium phosphate. Therefore, if the amount of carbonate (determined as carbon dioxide) is found, the amount of calcium as the carbonate can be calculated. This carbonate calcium value when subtracted from the total calcium value leaves the amount of calcium combined with the phosphate. The latter value is known as the "residual calcium" and bears a definite relation to the phosphorus content. From a theoretical standpoint, this ratio is $\frac{\text{Residual calcium}}{\text{Phosphorus}} = 1.94$ in the chemical compound $Ca_3(PO_4)_2$. In a large number of bone analyses, Shear and Kramer found that this ratio was practically a constant value, whether the bone was normal or the result of pathologic calcification. Their mean value for this ratio as found in some hundred or more analyses was approximately 2. In only one case of pathologic calcification did they find a higher ratio (2.23), this being in a calcified fibroid of the uterus. In a later paper, Kramer and Shear[14] show that this higher ratio is obtainable in cases of fresh calcification, as in healing rickets.

Applying this interpretation to the results obtained in this investigation one notes that of the twenty analyses made only five show a distinctly high calcium to phosphorus ratio. According to the interpretation given by Kramer and Shear, this can only mean that fresh calcification is taking place in the sinus bones of those individuals. It is impossible at this time to go further into the probable nature of the calcium involved in evidence of fresh calcification.

If one considers another ratio, that of carbonate calcium to total calcium, one notes that in the compound 3 $Ca_3(PO)_2.CaCO_3$ this ratio should be 1 to 10; e. g., 10.1 per cent. In young bones and in bone showing fresh calcification, Kramer and Shear found ratios of that magnitude, whereas in old bones that ratio was about 15 per cent. All our sinus bone specimens show a ratio less than 10.7, although there is a great variation in the age of the patients. This low ratio, according to Kramer and Shear, indicates a low proportion of calcium carbonate in the diseased sinus bone and also gives indications of primary calcification. Therefore, without going further into the question of the chemical composition of diseased sinus bone, it seems to be evident that there is primary calcification taking place. Further work in this direction is necessary for a more complete understanding of the nature of changes in the sinus disease.

According to Wells,[15] "calcification in normal tissue seldom occurs, except in the formation of bone. Often the infiltrated tissue is completely dead, as in infarcts, organic foreign bodies, caseous areas, and particularly in old inspissated collections of pus. It may be said that any area of dead tissue that is not infected, and that is so large or so situated that it cannot be absorbed, will probably become infiltrated with lime salts." It seemed to us, therefore, that the sinus membrane should show evidences of lime deposit. No evidence of tissue calcification could be detected. From the chemical analyses of the membrane it is evident that no appreciable calcification has taken place, since our values range from 0.77 to 3.31 per cent of calcium, with the phosphorus percentage very low and the carbonate content negligible. If this is contrasted with the results of Kramer and Shear[16] on calcified tissues, one notices a great difference, in that their values for the calcium content ranged from 20 to 32 per cent with correspondingly high amounts of phosphorus and carbonate. Therefore, the only conclusion that can be reached is that there is no appreciable tissue calcification in diseased sinus membranes.

The same can be said of the presence of calcium carbonate and calcium phosphate in the polyps and pus associated with the sinus infection. Our analyses on the dried polyps or pus material showed practically no calcium, phosphate or carbonate. In seventeen operative cases, only five gave a sufficient amount of pus for a chemical examination. This is too few cases on which to base any conclusions. In ten other pus samples obtained by irrigation, it was, of course, impossible to get any quantitative data, since by the process of irrigation the absolute quantity of pus present in the sinus cavity could not be determined. However, certain qualitative tests were made on samples of pus obtained from both sources. The possible presence of potassium thiocyanate in sinus secretion is suggested by Torrigiani,[17] since he found it to be present in many cases of nasal discharges which he examined. When we made the same examination our results were all negative with one exception. In this instance the operative

9. Leiboff, S. L., and Kahn, B. S.: J. Biol. Chem. **83**: 347 (Aug.) 1929.
10. Benedict, S. R.: J. Biol. Chem. **51**: 187 (March) 1922.
11. Whitehorn, J. C.: J. Biol. Chem. **45**: 449 (Feb.) 1921.
12. Folin, Otto; and Wu, Hsien: J. Biol. Chem. **41**: 367 (March) 1920.
13. Taylor, N. W., and Sheard, C.: J. Biol. Chem. **81**: 479 (Feb.) 1929.
14. Kramer, Benjamin; and Shear, M. J.: J. Biol. Chem. **79**: 147 (Sept.) 1928.
15. Wells, H. G.: Chemical Pathology, ed. 5, Philadelphia, W. B. Saunders Company, 1925, p. 489.
16. Kramer, Benjamin; and Shear, M. J.: J. Biol. Chem. **79**: 121 (Sept.) 1928.
17. Torrigiani, C. A.: Acta oto-laryng. **8**: 563, 1925.

specimen was negative at the time it was obtained and remained negative. The irrigation specimen was negative at the time it was obtained but gave a strongly positive test seventy-two hours later. One week later, the test was again negative. The meaning of this behavior in this one isolated case is not susceptible of interpretation at this time. Again, nasal secretions, according to Torrigiani[17] are generally acid. Results of this test in our series, both operative and irrigative, were either acid or neutral after twenty-four hours. In some of the irrigation samples, however, the reaction was alkaline when tested immediately. The presence of reducing sugar was tested for, both before and after hydrolysis of a specimen of the pus. The test was made with the usual Fehling and Benedict reagents and directions. Each test was negative when compared with the same test applied to a specimen of saliva similarly treated. This result indicates that none of our pus samples were contaminated with saliva.

The possible presence of an increased amount of calcium in pus has been indicated by Friesner and Rosen.[18] They found that in pus samples from cases of lung abscess, empyema, meningitis and adenitis the calcium content was from 3 to 8 mg. per hundred cubic centimeters of pus, whereas, in pus coming from the ear canal in mastoid and other ear infections, the calcium content was much higher, from 15 to 48 mg. per hundred cubic centimeters of pus. In the two cases wherein it was possible to make a calcium determination on the uncontaminated pus, values of 10.9 and 12.5 mg. of calcium per hundred cubic centimeters were found. These values are considerably below those obtained by Friesner and Rosen and check our previous observations that there are no abnormal chemical changes in the bone that would be significant of bone alteration in sinus disease.

In a series of thirty-three cases with a positive diagnosis of sinus disease in which chemical analysis of the blood was done, eighteen showed an increase of blood calcium above the established high normal. In only one patient with a positive sinus disease was the serum calcium below the average minimum normal.

In one case the bone examination showed a high calcium phosphorus ratio, 2.62, with a high blood serum calcium content, 12.7, but the tissue removed from the sinus showed a low calcium content, 1.16. There was present in this case a mild degree of diabetes but extensive sinus disease.

It is noted that five cases in this series showed a high calcium phosphorus ratio in the bone, together with a high blood calcium content. In one case the calcium phosphorus ratio was increased in the bone with an increase of calcium found in the tissue and with a high serum calcium.

Seven cases in these series showed a high calcium content in the tissue and a relatively normal calcium phosphorus ratio in the bone, with two exceptions. These cases also showed a high serum calcium with two exceptions.

Of the eighteen patients operated on for definite and extensive chronic sinus disease, two showed a high blood serum and tissue calcium. Two showed a high serum and tissue calcium but low bone calcium. None showed a high tissue and bone calcium with a low serum calcium. Three cases showed a high bone and serum calcium with a low tissue calcium. Only one case showed a high bone calcium with the serum and tissue calcium both low. Two showed a high calcium in the tissue with low bone and serum calcium. There were no patients with a high serum calcium associated with low bone and low tissue calcium.

Regardless of the fact that this is in the nature of a preliminary report, we can state that, as yet, we have not been able to determine any characteristic or consistent chemical observations that are significant of bone, tissue or blood changes in sinus disease and that could be looked on as having any bearing on its diagnosis, prognosis or treatment.

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18. Friesner, Isidore; and Rosen, Samuel: Calcium Content of Pus, J. A. M. A. 88: 1231 (April 16) 1927.

ABSTRACT OF DISCUSSION

DR. MATTHEW S. ERSNER, Philadelphia: The normal calcium content of human blood is very constant and ranges between 9 and 11 mg. per hundred cubic centimeters. In tetany following parathyroidectomy there is a decrease in the blood calcium. In infantile tetany the calcium falls between 3.5 and 7 mg. In normal infants and children the inorganic phosphorus of the blood averages slightly above 5 mg. per hundred cubic centimeters. In adults it is lower—I should say about 3.5 mg. and sometimes as low as 2 mg. The authors call attention to a series of thirty-three patients who had a positive diagnosis of sinus disease and when chemical analyses of the blood were made it was found that eighteen of these (more than 50 per cent) showed an increase in the blood calcium above the established high normal of 11. Although this is not pathognomonic, nevertheless one should take heed of this observation. The authors state that there was no increase in the tissue calcium but that there was an increase in the blood calcium. What does this mean? It simply means that there is some metabolic disturbance whereby the sinus tissues do not assimilate the proper proportion of calcium and one therefore finds an increase in the blood calcium. Dr. Dean of St. Louis and his co-workers called attention to the fact of avitaminosis and suggested supplementary treatment with cod liver oil, viosterol and various kinds of lamps to stimulate cellular activities in order to promote calcium metabolism. It would be interesting to observe the results after the supplementary treatment and ascertain whether there would be a marked improvement in the sinus condition and whether the blood calcium would become lower as the improvement continues.

DR. HENRY S. WIEDER, Philadelphia: The authors call attention to the fact that five of the twenty analyses of the calcium to phosphorus ratio in the removed bone were distinctly high, whereas the carbonate calcium to total calcium ratio remained approximately 10 per cent even in older patients in whom the ratio should have been approximately 15 per cent in old bone. These facts, if the interpretation of Kramer and Shear is accepted, undoubtedly point to young bone formation with primary calcification. This is in accord with the pathologic studies of Eagleton and the roentgen observations of Pfahler and Hertz and Worms. These authors point out that in chronic sinus disease there are marked disturbances of the underlying bone, Pfahler even asserting that disease of the sinus may extend to the base of the skull quite remote from the situation of the sinus involved, such as the clinoid process and the sella turcica and the posterior fossa of the skull. However, these chemical analyses of bone are, unfortunately, of little practical value from a diagnostic standpoint, since one does not secure the bone until the operation has been performed, at which time the diagnosis can be made clinically. Nevertheless, it is important to continue studies along this line and accumulate statistics which should be linked up and associated with definite pathologic studies of the bone and mucous membranes, after careful roentgen studies have been made while the bone is still in place. I believe it is the feeling of most otolaryngologists that while there may be great possibilities in the roentgen diagnosis of sinus disease in the future, not many today are willing to sacrifice their clinical observations in favor of the roentgen interpretations. I think that many failures to agree in diagnosis could eventually be explained if an extensive study along the lines of this paper, associated with a pathologic study of the tissue, should be made.

DR. SIDNEY ISRAEL, Houston, Texas: I agree with Dr. Ersner that since in eighteen cases out of a total of thirty-three there was a high blood serum calcium, one would think that these observations would be significant in sinus diseases. An analysis of these eighteen cases, however, shows that in the most extensive and severe cases the blood serum calcium was relatively low, and in other cases wherein only slight involvement was present it was high. Therefore, in eighteen out of thirty-three cases showing high blood serum calcium, one could not say that these observations would be diagnostic of the presence or significant of the extent of sinus disease, because in the cases with most extensive involvement, in many instances, there was found a low calcium content in the blood serum. Several interesting problems have arisen since this study was undertaken and will form the basis of further report at a later date.

ROENTGENOLOGIC DIAGNOSIS OF APPENDICITIS *

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Roentgenology offers a valuable aid in the diagnosis of appendicitis, and it seems not unwise to emphasize its importance and to stress further certain points already familiar to most roentgenologists.

The early literature is filled with chaotic controversy as to whether visualization or failure to fill constitutes appendical disease, but one finds a woful lack of agreement and failure to establish any authentic signs or sign complex. More recent observers have discussed the important roentgenologic observations, but by many this subject has been unheeded, and the method has failed, we believe, to receive the consideration that it merits.

It is not our intent to enter into a discussion of technical minutiae; however, it may not be unwise to mention a few essentials in the roentgenologic examination. According to our experience, the opaque material should be administered in as fluid a suspension as is possible and at least 12 ounces of the mixture should be ingested. This should be taken approximately eighteen hours before the examination, and no purgatives nor enemas should be permitted during this time. In doubtful cases or in acute conditions in which oral administration is not permissible, the opaque enema may give valuable information; especially have we found this true in cases of suspected abscess, in which the relationship of the mass to the cecum may be established. While statistics vary as to the percentage of appendixes that can be filled, in our series in more than 80 per cent either the entire viscus or some part of it can be visualized. Roentgenograms may furnish a valuable means of keeping permanent records, but the essential feature in this examination is palpation under fluoroscopic control. This palpation should be sufficiently deep to allow satisfactory exploration of the cecal area, the patient being rotated and the position changed in any direction that may be necessary. Muscular relaxation is of the greatest importance. To reiterate, only by palpation under fluoroscopy can the important roentgenologic signs of appendicitis be elicited.

Enumerated in the order of their relative value, the roentgenologic signs are:

1. *Tenderness and Muscular Rigidity.*—This sign is produced by pressure directly over the appendix; it can be elicited only by palpation sufficiently deep to permit satisfactory exploration of the cecum, and it is the most important of all signs in this examination. While pain may be produced by pressure applied at a distance from the appendix, its point of maximum intensity should coincide with the viscus, and this localization must be definite and constant. If the appendix is mobile, the tender point changes with the altered position of the organ.

2. *Fixation of the Appendix.*—The normal appendix is freely movable and can easily be displaced by the palpating hand. When its position cannot be altered, it is indicative of an inflammatory process, either primary or secondary, active or quiescent. If fixation is accompanied by tenderness, unquestionably the process is either acute or subacute. Either the entire length of the viscus may be fixed or the process may be confined to the tip. When the appendix is situated in the pelvis there may be difficulty in separating it from the pelvic viscera; palpation with the patient in the Trendelenburg position will usually overcome this difficulty unless true fixation is present. Occasionally we have found bimanual palpation, one hand on the abdominal wall and one in the posterior culdesac, of material aid in satisfactorily exposing a pelvic cecum.

3. *Pain Referred to the Appendix, Produced by Pressure over Other Parts of the Abdomen.*—This sign is based on the well known clinical principle of referred pain, the visualization and knowledge of the exact position of the appendix rendering it much more accurate.

4. *Abnormal Position of the Appendix.*—While normally situated on the mesial aspect of the cecum, the appendix is found not uncommonly in various other locations, chief among which may be mentioned the retrocecal appendix, the subphrenic appendix as found in an undescended cecum, the left-sided appendix in cases of nonrotation of the cecum, and the appendix that arises in the normal position but lies parallel to the cecum, either on its lateral or on its mesial aspects. Quite obviously, inflammation in an abnormally situated appendix will not produce pain or tenderness over McBurney's point and may simulate disease in other innocent organs. Especially is this true of an appendix located in the upper right quadrant, which may give the classic picture of gallbladder disease, and of the postcecal appendix, which may so closely imitate the symptoms of renal or perinephric disease. In acute inflammatory processes, especially when an abscess is present, a knowledge of the exact position of the appendix is of the greatest aid to the surgeon in selecting the avenue of approach and may prove to be a life-saving measure.

5. *Spasticity of the Cecum.*—Disease conditions of the appendix quite commonly produce a reflex spasm of the cecum, which, when accompanied by other signs, is of diagnostic importance. Quite often the first clue to cecal spasticity is a residue in the terminal ileum at the end of eighteen hours. This, in the absence of stenotic conditions, is most suggestive. Especially is this spasticity suggestive in cases in which the appendix cannot be visualized but in which tenderness is elicited by pressure over the caput coli.

6. *Pain Referred to Other Parts of the Abdomen, Produced or Increased by Pressure over the Appendix.*—That the appendix may occasion pain which is referred to other parts of the abdomen is well known. When this pain is produced by pressure over the visualized appendix or is increased by pressure, it is of

* From the roentgenologic clinic of Drs. Groover, Christie and Merritt.
* Read before the Section on Radiology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

considerable diagnostic importance, especially if associated with any of the aforementioned signs.

This summary, in our opinion, stresses the more salient points of the roentgenologic study of the appendix; their proper application furnishes, we believe, a valuable aid both in discovering disease conditions and in excluding them, the latter being of equal if not of greater importance than the former.

Microscopic study often fails to differentiate between an appendix that shows pathologic changes and one that produces clinical symptoms. We believe that the gross appearance of the appendix, as revealed by surgical exploration, and the future state of the patient's health constitute the best proof of the accuracy of the diagnosis. In those cases in which the advice of the roentgenologist has been followed, the results have been so satisfactory that we feel no hesitation in commending the procedure.

1835 I Street, N. W.

ABSTRACT OF DISCUSSION

DR. H. H. KERR, Washington, D. C.: The complacency that resulted from learning so much and knowing so much about appendicitis was disturbed recently on the discovery that the mortality from appendicitis is alarmingly high. Too many people are dying from appendicitis. There isn't any disease that is more amenable to treatment than appendicitis, because one can cure it radically. One can completely remove the disease, and the patients then only have to recover from surgery. With careful and clean surgery, there should be little or no mortality. There is trouble somewhere, and the trouble, as is so often the case, goes back to diagnosis. Anything brought before the profession that aids in the diagnosis of appendicitis is of tremendous importance. What the authors said about the fluoroscopic diagnosis of appendicitis I believe in thoroughly, and I have availed myself of fluoroscopic consultation with Dr. Merritt for years and Dr. Moore more recently in the question of diagnosis of appendicitis. I have used fluoroscopy to make diagnosis in an acute attack of appendicitis. In children, for instance, in whom the diagnosis is not easily made, a barium enema will not do any harm and will often allow one to make a definite diagnosis in an acute attack. In the subacute or the interval or the so-called growling appendix, the fluoroscope is of tremendous value. But every one knows that an appendix that is chronically or subacutely diseased or has been diseased can produce symptoms elsewhere and sometimes symptoms of grave import. In these cases the elaboration of the apparent distant symptoms that may be due to the appendix can often be brought out by fluoroscopy. The appendix that is hidden behind the cecum is a real menace when it becomes infected. It can be discovered by fluoroscopy. The appendix that is hiding on a mobile cecum deep in the pelvis can be found by fluoroscopy. I believe there is no greater aid to the elaboration of the diagnosis of appendicitis than the fluoroscope. This paper was presented to the wrong section. I think it should have been presented to the section on internal medicine and to the section on pediatrics, and also to the section on surgery. I believe that this section has the job of selling this question of fluoroscopic diagnosis of appendicitis to medical and surgical friends at home.

DR. B. H. ORNDOFF, Chicago: I should like to emphasize the change of position of the patient during examination. The authors pointed out that it is necessary to palpate with good method in order to elicit these observations, but I believe much can be added to any method of palpation by varying the position of the patient. I should also like to emphasize especially the filling of the colon with an opaque enema in the detection of pathologic conditions in this region, while the patient is in different positions. The most favored position for administering an enema, as well as for palpation after opaque substances are taken by mouth, is with the patient rotated with the right side upward and the shoulders below a level of the hips. When an enema is administered with the patient in this position, one finds in almost every case excellent relaxation of the colon. The lowest point is the splenic flexure, and the opaque material fills this portion by gravity. The transverse and descending colon, while in this position, fill like a U-shaped tube and as the fluid level passes up through the transverse colon, carrying whatever gas may have accumulated in the bowel above the fluid, the presence of pathologic conditions in the hepatic flexure, ascending colon, cecum and appendix are elicited more definitely than can possibly be determined in other positions. In this position, palpation can be conducted in a most satisfactory and helpful manner. The level of the hips and shoulders can be varied and the amount of distention and level of the fluid in the colon can be varied by siphon action through the enema tube. This procedure will permit filling of the appendix in cases in which it would otherwise be impossible to visualize the appendix.

DR. A. B. MOORE, Washington, D. C.: Appendicitis apparently, since the Americans' discovery of it, has always been more or less of a controversial disease. In regard to what Dr. Orndoff said, I concur heartily. I think that probably he didn't hear what I said about changed position. I did not intend to stress it too much, but incorporated in the paper will be found advocacy of rotation and change of position. We certainly find it most valuable. Dr. Orndoff speaks of preinflammatory processes; I have a feeling that most of the gross changes which one is able to demonstrate are not preinflammatory but postinflammatory.

THE COFFEY-HUMBER EXTRACT OF SUPRARENAL CORTEX SUBSTANCE

A CLINICAL STUDY OF FOUR HUNDRED AND FIFTEEN PATIENTS WITH MALIGNANT TUMORS WHO RECEIVED EXPERIMENTAL INJECTIONS

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This paper is presented as a brief summary of the results of a clinical and pathologic study conducted by the W. K. Kellogg Foundation. Four hundred and fifteen persons who had carcinoma or sarcoma were given subcutaneous injections of suprarenal cortex substance extract by representatives of Drs. Walter B. Coffey and John D. Humber, and were observed and examined by physicians of the foundation. Case abstracts made by former physicians were furnished by these patients on beginning experimental injections. The majority of the patients first had received injections of the extract at the Los Angeles Central Coffey-Humber Clinic and were transferred with their records to the Kellogg Foundation. Some patients were accepted by the foundation for their first injections of the extract.

The majority of the patients were ambulatory. They received injections of the extract and made progress reports at the foundation clinic at Boyle and Michigan avenues. They lived in widely separated localities and were encouraged to depend on cooperating local physicians for general medical care and on surgeons of their choice for the performance of such palliative operations as might become necessary. Approximately seventy patients in all were brought to the clinic by automobile or ambulance, and received the extract injections without entering the building. One hundred and eighteen patients received extract injections and were under the care of physicians of the foundation for varying periods of time at a hospital on Whittier Boulevard, which was leased and operated by the foundation exclusively for this purpose. Some who received the extract were first ambulatory, then car patients and finally hospital patients.

With few exceptions, the patients whose cases are reported in this paper were incurable by surgical opera-

tion, by radiation therapy or by any other known method of treatment. The diagnosis of malignancy was established by microscopic examination of tissues in 326 cases, and by roentgen examination or exploratory surgical operation in other cases. A few patients had had apparently complete surgical removal of malignant tumors and had no discoverable metastases but were permitted to receive injections of the extract as a prophylactic measure. The study of such patients could be useful in determining the effect of the extract in the prevention of recurrence only if there should be no recurrence in an unusually large percentage of these patients after continuing use of the extract over a period of several years.

TABLE 1.—*Duration of Malignant Disease*

	Number of Patients		
	Carcinoma	Sarcoma	Total
Less than one year	141	10	151
One year but less than two years	88	8	96
Two years but less than three years	45	6	51
Three years but less than four years	31	2	33
Four years but less than five years	15	2	17
Five years but less than six years	17	0	17
Six years but less than seven years	9	2	11
Seven years but less than eight years	4	0	4
Eight years but less than nine years	5	0	5
Nine years but less than ten years	5	0	5
Ten to fourteen years	12	1	13
Fifteen to nineteen years	6	1	7
Twenty years or longer	5	0	5
Totals	383	32	415

The method of preparation of the extract of suprarenal cortex substance has been described by Drs. Coffey and Humber in their application for the patent (1,771,976) granted them by the United States government. The extract has not been available to those connected with the foundation for chemical examination, for animal experimentation or for administration to patients.

The extract was injected subcutaneously in doses usually of 12 minims (0.7 cc.) twice weekly, after three or four initial graduated doses. A few patients received larger amounts for a time, usually not exceeding 30 minims (1.9 cc.), and many patients received doses of less than 12 minims, these modified doses being determined by the condition of individual patients.

The physicians of the foundation have made no claim as to the potency of the extract in producing changes in malignant growths. They have assumed and maintained the position of cooperating but independent observers committed only to the finding of facts.

This report includes only those patients who were actually under the observation of the foundation, and does not discuss the much greater number who received injections of the extract at other clinics, nor the patients mentioned in illustrative cases in the published papers of Drs. Coffey and Humber.

Clinical records and autopsy reports were made in duplicate. The Los Angeles Central Coffey-Humber Clinic was furnished a copy of the record in each case. By agreement with the central clinic, few new patients were accepted by the foundation after the middle of October, 1930. A preliminary report covering the first six months of the work of the foundation, during which 398 patients were observed, was prepared, and a copy was sent to Drs. Coffey and Humber, Jan. 2, 1931. In February, 1931, the clinic and hospital were closed by the board of trustees of the W. K. Kellogg Foundation, and patients who were then receiving the suprarenal cortex extract were transferred to other clinics.

In this study, which was made by the foundation, clinical evidence was sought of increased or decreased appetite, of gain or loss in weight, of altered feeling of general well being, of alleviation or increase of pain, and of changes in malignant tumors, both primary and metastatic. In those patients who came to autopsy, necrosis and sloughing of malignant tumors were studied as to occurrence and degree, by observation of tumors and by microscopic examination of tissues. Consideration was given to the effects produced by necrosis and sloughing when such changes occurred.

Among the patients observed, the largest groups were those presenting carcinoma of the breast, of the uterus, of the rectum, and of the stomach, and comprised a total of 258 patients. Only one thirteenth of the total number of patients had sarcoma. At commencement of use of the extract, the average age of the patients with carcinoma was 55.4 years, and the average age of the patients with sarcoma was 44.12 years.

Facts as to sex and age of patients, diagnoses, surgical operations, radiation therapy, experimental injections of the extract, and the duration and termination of the disease were tabulated, and supplemental tabulations were made. Important summaries and conclusions are presented in this paper.

One hundred and seventeen patients had had the disease for three years or longer, 147 had had the disease one or two years, and in 151 cases the disease had been present less than one year (table 1).

Surgical operations, either radical or palliative, had been performed for 255 patients, and 160 had had radiation therapy. One hundred and two patients had had both surgical operation and radiation therapy, 103 patients had had neither operation nor radiation, 153 had had surgical operation without radiation, and 57 had had only radiation therapy.

Drs. Coffey and Humber hold that the extract acts by supplying at regular intervals a principle lacking or deficient in patients with malignant disease. Marked benefits from the experimental injections were not usually expected until after patients had received at least fifteen injections of the extract. Table 2 summarizes the number of experimental injections of the extract received by the patients to the end of the period of observation of these patients by the foundation.

TABLE 2.—*Number of Injections of the Extract*

Injections	Number of Patients
Less than 15	81
From 15 to 24	83
From 25 to 34	70
From 35 to 44	75
From 45 to 54	40
From 55 to 64	32
From 65 to 74	13
Seventy-five or more	21
Total number of patients	415

A spirit of optimism prevailed generally among the ambulatory patients. Many were enthusiastic in their praise of the benefits they were receiving from use of the extract. However, continued increase in the size of primary growths and of metastases accessible to examination was found to occur even in patients who felt better.

Some patients discontinued taking the injections because they were financially unable to remain longer

in Los Angeles. Some saw no benefit from the injections of the extract which they had received, or insufficient benefit to induce them to continue the injections. Many became too weak to come to the clinic even in an ambulance. The extract was not released to local physicians, and patients confined to their homes, with one or two exceptions, were unable to continue the injections of the extract.

Suprarenal extracts in general may stimulate the appetite, improve muscle tone and increase the feeling of general well being of those to whom they are administered. Many patients taking the Coffey-Humber extract have had improved appetite and have felt better for a considerable time. The extract has had little influence on the appetite or feeling of general well being of patients who were nearing a fatal termination of the disease.

The state of nutrition of the patients at the time of coming to the foundation is indicated in a general way by the weights of 250 patients who were weighed at the clinic or hospital (table 3). Of these patients, five men and twenty-six women weighed less than 101 pounds, and one man and fourteen women weighed

TABLE 3.—*Grouping of Patients by Sex and Weight at First Weighing*

Groups by Weight in Pounds	Number of Patients in Each Group		
	Men	Women	Total
61–70	0	1	1
71–80	0	4	4
81–90	2	8	10
91–100	3	13	16
101–110	4	20	24
111–120	12	21	33
121–130	11	29	40
131–140	10	24	34
141–150	15	18	33
151–160	13	8	21
161–170	2	5	7
171–180	6	6	12
181–190	1	6	7
191–200	0	2	2
201–210	0	2	2
211–220	0	4	4
Totals	79	171	250

more than 180 pounds at the first weighing. Many of the patients did not show any outward sign of their serious malady.

Changes in weight were investigated by weighing patients at intervals of from ten to fourteen days on platform scales at the clinic or at the hospital. They were weighed at each time at approximately the same hour of the day and under similar circumstances as to meals and clothing. From two to twenty weights were obtained for each patient in 207 cases, and 43 other patients were weighed once. Many patients who were confined to bed in the hospital and many who were brought to the clinic by automobile or by ambulance were not weighed.

Of those who were weighed two or more times, 134 lost in weight, 6 neither gained nor lost, and 67 gained in weight. One hundred and nine patients lost 2 or more pounds in weight, 52 neither gained nor lost as much as 2 pounds, and 46 gained 2 or more pounds in weight.

One hundred and thirty-four of the patients who were weighed two or more times showed an average loss of 7.26 pounds per patient.

Sixty-seven of the patients who were weighed two or more times made an average gain of 4.82 pounds per patient.

Of the persons who lost in weight, as shown by the difference between the first and last weights determined, twenty-four made intervening gains above the initial weight, the average temporary gain in weight being 1.73 pounds. Nine of the patients who gained had intervening losses in weight, the average temporary loss being 2.16 pounds.

Statistics alone do not convey a correct impression as to changes of body weight following use of the extract. Modifying factors must be considered in any evaluation of gain or loss in weight of these patients, such as duration of the disease, location and nature of the primary growth, complete surgical removal of tumors, radical surgery or radiation therapy affecting the ovaries, the menopause, obesity, and the occurrence of pleural effusion, ascites, or edema of one or more of the extremities. The following statements in regard to the twenty-eight patients who made gains of 5 or more pounds in weight over the period of weight observation illustrate the necessity for careful consideration of the facts:

CASE 7.—Miss M. H. (deceased), with carcinoma of the breast, who weighed 134 pounds at the first weighing, gained 9 pounds in sixty-three days, the modifying factors being great edema of the right arm, right pleural effusion, and edema of both lower extremities.

CASE 13.—Mrs. G. H. M. (deceased), with carcinoma of the breast, who weighed 122 pounds at the first weighing, gained 9½ pounds in forty-two days, the modifying factors being edema of the left arm and left pleural effusion.

CASE 36.—Mrs. B. K., with carcinoma of the breast, weighed 105¾ pounds at the first weighing, and gained 7½ pounds in fifty-nine days, the modifying factor being edema of both lower extremities.

CASE 42.—Mrs. M. B., with carcinoma of the breast, who weighed 211½ pounds at the first weighing, gained 10 pounds in ninety-five days, the modifying factors being obesity and the menopause.

CASE 91.—Mrs. M. P., with carcinoma of the breast, who weighed 131¾ pounds at the first weighing, gained 7½ pounds in seventy days, this being a so-called postoperative or prophylactic case.

CASE 94.—Mrs. L. B. (deceased), with carcinoma of the breast, who weighed 111¼ pounds at the first weighing, gained 13 pounds in thirteen days.

CASE 111.— Mrs. M. C., with carcinoma of the uterus, who had had operation and radiation therapy of the pelvis, weighed 138¼ pounds at the first weighing and gained 8¾ pounds in 184 days.

CASE 118.—Mrs. O. H. B., with carcinoma of the uterus, who had had radiation therapy of the pelvis, weighed 90½ pounds at the first weighing, July 7, 1930, and gained 7¾ pounds in 168 days, during which an ovarian cyst increased in size, filling the abdomen. I have learned that on March 10, 1931, an ovarian cyst weighing 26 pounds was removed and that the weight, which was thus reduced to 81 pounds, gradually increased to 90 pounds by June 10, 1931.

CASE 120.—Mrs. A. T. (deceased), with carcinoma of the uterus, who had had radiation therapy of the pelvis, weighed 125½ pounds at the first weighing, and gained 9¼ pounds in 161 days, the modifying factor being edema of both lower extremities.

CASE 152.—Mrs. C. E. G. (deceased), with carcinoma of the uterus, who had had operation and radiation therapy of the pelvis, weighed 148¾ pounds at the first weighing and gained 5¼ pounds in seven days, the modifying factor being edema of the right lower extremity.

CASE 156.—Mrs. V. S. (deceased), with carcinoma of the uterus, who had had operation and radiation therapy, weighed 104½ pounds at the first weighing and gained 5½ pounds in fourteen days, the modifying factor being edema of both lower extremities.

CASE 171.—Mrs. A. A., with carcinoma of the uterus, who had had apparently complete surgical removal of the tumor and now had a so-called prophylactic case, weighed 148¼ pounds at the first weighing and gained 8½ pounds in eighty days.

CASE 195.—Mrs. M. L., with carcinoma of the ovaries, who had had bilateral oophorectomy and now had a so-called prophylactic case, weighed 123 pounds at the first weighing and gained 5 pounds in 118 days.

CASE 197.—Mrs. M. G. (deceased), with carcinoma of the right ovary, who weighed 102 pounds at the first weighing, one month after right oophorectomy, gained 6½ pounds in eleven days.

CASE 217.—Mr. D. J. C., with carcinoma of the prostate, who weighed 140½ pounds at the first weighing, gained 5½ pounds in eleven days. No change in the prostate had been noted on examination during the preceding two years.

CASE 225.—Mr. A. W., with carcinoma of the bladder, who had had partial cystectomy, June 10, 1930, when his weight was 185 pounds, had lost in weight to 173 pounds at the first weighing. He then gained in weight up to 196 pounds by December 31, the modifying factor being apparently complete surgical relief of the condition.

CASE 236.—Mrs. M. S. (deceased), with carcinoma of the sebaceous glands over the right mastoid and the adjacent area, who had had palliative surgical removal of a large tumor mass, July 2, 1930, weighed 130¼ pounds at the first weighing, three weeks after operation, and gained 10¼ pounds in ninety-one days, 9¾ pounds being gained in the first thirty-five days.

CASE 238.—Mrs. F. M. T., with basal-cell carcinoma of the right pinna and the adjacent area, was in good general health, weighed 163¾ pounds at the first weighing and gained 5¼ pounds in 157 days.

CASE 298.—Mr. J. R. M., with carcinoma of the stomach, who had had a partial gastrectomy followed by radiation therapy, constituting a so-called prophylactic case, weighed 138 pounds at the first weighing and gained 5½ pounds in forty-nine days.

CASE 302.—Mrs. E. D. (deceased), with carcinoma of the stomach, weighed 71½ pounds at the first weighing and gained 7½ pounds in thirty-five days, the modifying factors being bilateral pleural effusion, ascites and edema of both lower extremities.

CASE 311.—Mr. A. E. S., with carcinoma of the stomach, who had had a palliative posterior gastrojejunostomy, weighed 117¼ pounds at the first weighing and gained 20¼ pounds in eighty-five days, the modifying factor being surgical relief of pyloric obstruction.

CASE 329.—Mr. R. G. (deceased), with carcinoma of the liver, who weighed 85 pounds at the first weighing just after exploratory surgical operation, gained 12 pounds in five days, the modifying factor being ascites.

CASE 336.—Mr. C. H. A., with carcinoma of the rectum for five years, who weighed 138¼ pounds at the first weighing, gained 11¼ pounds in 154 days.

CASE 348.—Mr. J. H., with carcinoma of the rectum, who weighed 153½ pounds at the first weighing, gained 8¾ pounds in 165 days.

CASE 349.—Mrs. I. M., with nonobstructive recurrence after resection of the rectum, who weighed 101½ pounds at the first weighing, gained 6 pounds in 142 days.

CASE 381.—Mr. E. T. (deceased), with carcinoma of the lung, weighed 147¼ pounds at the first weighing and gained 5¼ pounds in twenty-two days, the modifying factors being pleural effusion, ascites and edema of both lower extremities.

CASE 388.—Mr. J. B., with lymphosarcoma of the left groin, weighed 150½ pounds at the first weighing and gained 6 pounds in 144 days, the modifying factor being edema of the lower extremities.

CASE 389.—Mr. H. E. C., who had had surgical removal of spindle-cell sarcoma of the left thigh, not involving the bone, weighed 111½ pounds at the first weighing and gained 6½ pounds in 168 days.

In addition to the aforementioned twenty-eight patients who gained 5 or more pounds over the period of weight observation, there were six patients who made temporary gains of 5 or more pounds. In one of these, who gained the most, there were bilateral pleural effusion, ascites, and edema of both lower extremities. In one there was ascites. Of these six patients, five are known to have died.

Laboratory reports for hospital patients who were receiving the suprarenal cortex extract were tabulated,

TABLE 4.—*Known Deaths in Each Calendar Month*

June, 1930, to July, 1931												
June 15	July 27	Aug. 36	Sept. 35	Oct. 30	Nov. 27	Dec. 19	Jan. 19	Feb. 18	Mar. 12	Apr. 6	May 16	June 3	July 1

and the following statements in regard to the observations may be of interest:

The average hemoglobin percentage (Dare) for ninety-eight patients was 62, the lowest hemoglobin percentage at any time determined for each patient being used. The hemoglobin was below 40 in twelve cases, between 41 and 60 in thirty-one cases, between 61 and 80 in forty-three cases, and above 80 in twelve cases.

The average erythrocyte count on admission for 100 hospital patients was 3,740,000, and the average leukocyte count on admission for 99 patients was 11,900. The first erythrocyte count was below 2 million in two cases, between 2 and 3 million in twenty-two cases, between 3 and 4 million in twenty-five cases, and above 4 million in fifty-one cases. The first leukocyte count did not exceed 10,000 in fifty cases and was above 10,000 in forty-nine cases.

The average coagulation time of the blood for eighty-six hospital patients was five minutes, the coagulation time being prolonged beyond six minutes in thirteen cases.

Blood sugar determinations were made for seventy-five hospital patients, the average being 95.7 mg. of

TABLE 5.—*Age Distribution of Deceased Patients and Survivors*

Group by Age in Years	Original Number in Each Group	Deaths in Each Group	Patients Remaining
Less than 15	1	1	0
15 to 19	5	5	0
20 to 24	1	1	0
25 to 29	8	7	1
30 to 34	12	5	7
35 to 39	29	19	10
40 to 44	35	22	13
45 to 49	50	29	21
50 to 54	67	46	21
55 to 59	47	29	18
60 to 64	54	36	18
65 to 69	49	28	21
70 to 74	39	26	13
75 to 79	13	7	6
80 to 89	5	3	2
Totals	415	264	151

sugar per hundred cubic centimeters of blood, the highest reading for each patient being used. The blood sugar was normal in sixty cases, below 80 mg. in ten cases, and above 120 mg. in five cases.

The basal metabolic rate for sixty-two hospital patients was determined by use of the McKesson metabolator. The basal metabolic rate was normal in twenty-four cases, below — 10 in seven cases, and in the thirty-one cases in which the rate was above + 10 the average rate was + 33.

My associates and I at first hoped that the use of the suprarenal cortex extract would relieve the pain of many of those suffering with malignant disease and thus obviate in these cases the necessity for the use of narcotics. A few patients stated that they had relief from pain following injections of the extract. We were unable to find any general experience of lessened pain by use of the extract, among the patients observed, occurring on the day of or on the day after or in relation to injections of the extract. We found no lessened use of narcotics in relation to injections of the extract in those whose severe pain could be controlled only by narcotics.

TABLE 6.—*Distribution of Deceased Patients and Survivors in Relation to Location of the Primary Carcinoma*

Location of Primary Carcinoma	Number of Patients in Each Group	Number of Known Deaths in Each Group	Remaining Patients in Each Group	Remaining Patients Who Stopped Use of Extract	Remaining Patients Transferred and Not Known to Have Stopped Use of Extract
Breast	104	53	51	32	19
Uterus	81	54	27	20	7
Ovary	15	13	2	0	2
Vagina	2	0	2	1	1
Vulva	5	4	1	1	0
Prostate	13	7	6	5	1
Testis	2	1	1	0	1
Penis	1	1	0	0	0
Kidney	1	1	0	0	0
Bladder	9	3	6	3	3
Skin	15	2	13	6	7
Thyroid	1	1	0	0	0
Larynx	7	4	3	2	1
Lung	1	1	0	0	0
Mouth, jaws and related glands	23	17	6	4	2
Esophagus	10	8	2	2	0
Stomach	31	26	5	4	1
Pancreas and liver	9	8	1	0	1
Rectum and colon	47	31	16	9	7
Primary focus undetermined	6	4	2	2	0
Total carcinoma cases	383	239	144	91	53
Sarcoma cases	32	25	7	3	4

Our observations would indicate that relief from pain by the use of the suprarenal cortex extract cannot be expected when there is dense malignant infiltration of the tissues of the neck, axilla or groin; when the cervical, brachial or sacral plexus of spinal nerves is involved in tumor extensions; when there is serious obstruction of the urinary tract or gastro-intestinal tract, or when there is extensive sloughing of surface tumors.

Of the 118 hospital patients of this series, all but 12 required codeine, morphine or some other narcotic for relief from pain, with varying amounts and intervals but without discoverable relation between the dosage and the use of the extract. Of those who were free from severe pain, some had had no pain, some were relieved by non-narcotic anodynes, and in none did the suprarenal cortex extract appear to be responsible for freedom from pain.

Softening, necrosis, liquefaction and sloughing of malignant tumors will be considered from the clinical as well as the pathologic standpoint after presentation of facts in regard to patients who have died since the commencement of this study.

Two hundred and sixty-four of the patients observed by the Kellogg Foundation are known to have died, of whom 89 were men and 175 were women. Among the patients with carcinoma there were 239 deaths, and among the patients with sarcoma there were 25 deaths. The mortality of the entire group of patients was 63.6 per cent in the period from June, 1930, to July 4, 1931. Fifty per cent of the patients died in the eight months from June to January (table 4).

We have noted no significant relation of age to mortality except that all but one of the fifteen patients who were under 30 years of age have died (table 5).

Of the 415 persons who began the use of the extract, all but 57 patients are known to have been eliminated from continuation of the experiment by death or by discontinuance of the injections (table 6).

The average duration of the disease for the 239 patients who died of carcinoma was 2.49 years, and that of the 25 patients who died of sarcoma was 2.72 years. The average duration of life from discovery of tumor to date of death, for the patients arranged in groups according to location of the primary carcinoma, is shown in table 7.

The lowest mortality was found among those who had had the disease three years or longer at the beginning of the use of the extract. In the group of 117 patients who had had the disease three years or more, there was a mortality of 52.99 per cent. In the group of 151 patients who had known of the disease less than one year at commencement of the use of the extract, there was a mortality of 64.23 per cent. In the group of 147 patients who had had the disease one or two but less than three years, there was a mortality of 70.74 per cent.

The mortality of the patients who had had operation and no radiation was 59.4 per cent; of those who had had operation and radiation, 65.6 per cent; of those who had had neither operation nor radiation, 66.0 per cent, and of those who had had radiation and no operation, 66.6 per cent.

The intervals of time between the first injection of the extract and the date of death of those who are known to have died are shown for the patients in groups in table 8.

TABLE 7.—*Average Duration of Life from Discovery of Tumor to Death*

Primary Site of Growth	Number of Deaths	Average Interval in Years from Discovery of Tumor to Death
Breast	53	4.38
Uterus	54	2.08
Ovary	13	1.40
Vulva	4	1.36
Prostate	7	1.78
Testis	1	0.73
Penis	1	1.05
Kidney	1	1.94
Bladder	3	2.50
Skin	2	10.63
Thyroid	1	2.22
Larynx	4	1.80
Lung	1	0.93
Mouth and jaws	17	3.71
Esophagus	8	2.13
Stomach	26	1.04
Pancreas, liver and gallbladder	8	0.82
Rectum and colon	31	2.01

The immediate causes of death which were directly secondary to the malignant process in the patients observed were ureteral obstruction with kidney damage, intestinal obstruction, pyloric obstruction and biliary obstruction, perforation of the stomach or intestine with resultant peritonitis, hemorrhage from malignant tumors, and massive pleural effusion. Bronchopneumonia was considered directly secondary to the malignant condition only when there was an extensive sloughing tumor in the region of the upper respiratory

tract. A small number of the patients died of causes apparently independent of the malignant process, such as cerebral hemorrhage, endocarditis and bronchopneumonia.

Autopsies were performed by Dr. Howard A. Ball and cooperating pathologists in the cases of eighty-one deceased patients who had received injections of suprarenal cortex extract at the foundation clinic or hospital,

TABLE 8.—*Distribution of Deceased Patients by Interval from First Injection to Date of Death*

Time Interval in Days	Number of Deceased Patients
Less than 50	44
From 51 to 100	35
From 101 to 150	46
From 151 to 200	55
From 201 to 250	27
From 251 to 300	21
From 301 to 350	14
More than 350	22
Total	264

the examinations being made in most cases before embalming and within nine hours after death.

Sections of primary and metastatic tumors in these cases were made from frozen blocks of tissue and were stained and permanently mounted for study of necrosis or absence of necrosis in these tumors. Microscopic examinations were made by Dr. Howard A. Ball, and the work was reviewed by Dr. Newton Evans, scientific director of the foundation and pathologist of the Los Angeles County General Hospital. At the time of closing the clinic and hospital of the foundation, all the blocks of tissue from which sections had been made up to that time for the study of necrosis of malignant tumors and metastatic nodules were delivered to the central clinic for such further investigation as might be desired.

Records and microscopic slides from autopsies performed by Dr. Ball in twenty-seven cases of malignant tumor in which injections of the Coffey-Humber extract had not been given were used by him for comparison in the study of necrosis found at autopsy in patients who had received injections of the extract. These control cases represented the ordinary developments and outcome in cases treated by the usual methods and were comparable with the cases in which experimental injections of the extract had been given, as well as previous treatment by the usual methods.

Among the patients of the control series there occurred carcinoma of the stomach, of the breast, of the uterus, of the rectum, of the colon, of the ovary, of the prostate, of the gallbladder and of the liver, squamous-cell carcinoma other than that of the cervix uteri, sarcoma of the soft tissues of the neck, mesenteric lymphosarcoma, large round-cell sarcoma and malignant myoma of the uterus.

Necrosis and sloughing were frequently observed at autopsy in patients who had received injections of the extract, but there was no relation between the degree of these processes and the number of injections or amount of the extract previously administered. Any microscopic picture present in the series of patients who received the extract injections could be duplicated from similar cases in which no extract had been administered. No necrotic tumor nodule was found which did not contain many viable malignant cells. There was no essential difference in the occurrence of necrobiosis as observed microscopically in the cases in which the extract had been administered and in the cases in which no extract had been given, nuclear fragmentation and what might be termed "replacement fibrosis" being used as criteria.

The necrosis and sloughing of malignant tumors observed in those who were receiving the experimental injections of the extract were in practically all cases no greater in degree than the necrosis and sloughing which have been previously observed by us or by others in similar patients who received no extract injections. In no tumor, primary or metastatic, observed grossly or studied microscopically, was there complete eradication of the tumor by necrosis or sloughing.

The necrosis of malignant tissues in those who received injections of the extract could not be differentiated from that occurring naturally in malignant tumors. The necrosis which was found in patients receiving the extract was in our opinion due to the causes of necrosis generally recognized by pathologists, such for example as embolism, thrombosis, infarction, suppuration and cutting off of the lymph and blood supply of tumors by dense growth at the periphery. Those in whom necrosis was observed in some tumors had other tumors which did not show any such change. Nothing was observed clinically or at autopsy to indicate that the suprarenal cortex extract had any selective influence on the growth or necrosis or sloughing of malignant tumors of the patients of this series.

The average age of the eighty-one patients who came to autopsy was 54.8 years. No significant relation was discovered between the age of the patients and the degree of necrosis of malignant tumors.

The average known duration of the disease prior to beginning the use of the extract for these patients was 1.86 years, and the average interval of time between the first injection of the extract and the date of death was 121 days, or four months.

The average number of injections of the extract for the eighty-one patients was 27.4 and the average degree of necrosis 1.9 on a scale of grading of softening and necrosis from 0 to ++++. No necrosis was found in twenty cases. In twelve cases there was 3 + necrosis and in fifteen cases there was 4 + necrosis (table 9).

TABLE 9.—*Grouping of Autopsy Cases of Kellogg Foundation According to Number of Injections and Degree of Necrosis*

Degree of Necrosis	Groups by Number of Injections										Totals
	1-8	9-16	17-24	25-32	33-40	41-48	49-56	57-64	65-72	73-102	
0	3	3	6	2	3	1	0	0	2	0	20
+	3	1	2	1	1	1	0	1	0	0	10
++	3	3	6	1	3	1	3	2	0	2	24
+++	2	2	1	2	3	1	0	0	0	1	12
++++	6	1	0	1	2	2	2	0	1	0	15
Totals	17	10	15	7	12	6	5	3	3	3	81

Among the patients who came to autopsy, hydrothorax occurred seventeen times, hemothorax once, empyema of the pleura twice, ascites nine times, and edema of the extremities twelve times. Peritonitis was found in six cases, nephritis in sixteen cases, pyonephrosis in one case, pyelonephritis in ten cases, hydronephrosis in seven cases, purulent bronchitis in four cases, bronchopneumonia in twenty cases, lobar pneumonia in one case.

Softening and liquefaction of the malignant tumors in the patients observed, we believe, favored dissemina-

tion through the lymphatics and the associated veins. Softening of the carcinomatous axillary glands with lessening of the edema of the arm was not observed to occur among the patients studied. A few patients stated that decrease of the edema of the arm followed beginning use of the extract.

Necrosis of malignant tumors of the brain, liver, lungs and other internal organs was in our experience with these patients never beneficial. It seems reasonable to suppose that absorption of the products of necrosis of malignant tissues produced toxemia with harmful effects on the heart, kidneys and blood-producing organs.

Sloughing of malignant tumors in most of the cases led to loss of lymph and blood, and in many cases to severe hemorrhage and anemia. Patients in this series died of hemorrhage from carcinoma of the stomach, from carcinoma of the larynx, from carcinoma of the uterus and from carcinoma of the inguinal lymph glands, and patients were almost exsanguinated by hemorrhage from the uterus or by hemorrhage from the rectum.

Sloughing opened the way for and was hastened by pyogenic infection of tumors. Miserable results of sloughing of carcinomatous tumors of the uterus, vagina, bladder and rectum, including almost intolerable urinary and fecal fistulas, occurred in many of the patients observed. Sloughing of malignant tumors of the mouth and of the esophagus led to equally distressing results.

Malignant tumors were observed to increase in size, and new extensions and metastases to occur in many patients during the time that they were receiving the extract injections. As illustrations, great enlargement of the lymph glands occurred in the neck secondary to carcinoma of the mouth and secondary to carcinoma of the breast, great enlargement of sarcoma of the abdominal wall, extensive growth of metastatic carcinoma of the bony pelvis secondary to carcinoma of the prostate, increase in size of peritoneal masses secondary to carcinoma of the ovaries, and progressive enlargement of secondary carcinoma of the liver. In a few cases the great extent and rapidity of growth of the tumors suggested that the extract might have stimulated the tumors to increased activity.

No tumor of any patient in this series was observed to disappear either spontaneously or as a result of use of the extract. Apparently favorable changes in one or two cases after use of the extract, such as lessened redness of the skin over carcinomatous areas and reduction of the size of tumors by sloughing, had no noteworthy influence on the progress of the disease.

In view of the considerations presented in this paper, it is our opinion that:

1. The benefits of use of the suprarenal cortex extract experienced by patients with malignant tumors in relation to gain in weight and relief from pain did not occur uniformly or in the majority of the patients observed by us.

2. The extract administered to these patients had no selective influence on the growth, necrosis or sloughing of malignant tumors.

3. Necrosis and sloughing of malignant tumors were not beneficial but were detrimental to these patients, producing hemorrhage, anemia, distressing fistulas, perforation with abscess or peritonitis, and other serious consequences.

4. Cure of malignant disease in patients with advanced carcinoma or sarcoma, in view of the experience of the patients of this series, cannot reasonably be expected to occur as a result of use of the suprarenal cortex extract.

5. The benefits to be expected from use of the suprarenal cortex extract lie principally in improved appetite, improved muscle tone and bettered feeling of general well being of patients who are ambulatory or who are not too far advanced toward a fatal termination of the disease.

727 West Seventh Street.

Clinical Notes, Suggestions and New Instruments

THERAPEUTIC RESPONSE TO ERGOTAMINE TARTRATE IN PRURITUS OF HEPATIC AND RENAL ORIGIN *

S. S. LICHTMAN, M.D., NEW YORK

The treatment of pruritus, which patients with jaundice and azotemia commonly suffer, has usually in my experience been unsuccessful. The measures commonly employed aim at general or topical sedation or improved biliary excretion.[1] The prevailing conjectures as to the nature of the factors involved are that toxic substances such as intermediary carbohydrate metabolites [2] or abnormal decomposition products [3] affecting the cutaneous nerves are responsible for this symptom. The hypothesis has also been advanced that the mechanism responsible for pruritus is dependent primarily on an increased irritability of the sympathetic nerve endings.

If these substances, regardless of their exact nature, act by increasing the irritability of the sympathetic nervous system, a therapeutic response might be expected from the action of a pharmacologic depressant of this system, such as ergotamine tartrate. Employing this substance as well as other pharmacologically active agents, Brack [4] recently tested this hypothesis.

The clinical trial with remarkable response to minute doses of ergotamine tartrate is here reported in four patients with pruritus, two of hepatic and two of renal origin.

REPORT OF CASES

CASE 1.—A man, aged 59, admitted in January, 1931, had suffered attacks of severe epigastric colic and retrosternal pain for ten weeks. Icterus, which waxed and waned during this period, was accompanied by severe generalized pruritus. The liver was enlarged, hard and tender with a tender plum shaped mass attached to its lower margin. The spleen was palpable. The laboratory examination revealed: a slight anemia; an icterus index of 45; van den Bergh promptly positive; 2.5 mg. bilirubin per hundred cubic centimeters of blood; cholesterol 312 mg.; a negative blood Wassermann test; urea nitrogen, 18 mg. per hundred cubic centimeters of blood; sugar, 95 mg.

Ergotamine tartrate ("Gynergen") was administered in oral doses of 0.001 Gm. three times daily for four days. Definite improvement was noted after the second dose and complete relief from itching after the fifth dose. The clinical picture precluded the possibility of a spontaneous remission of this symptom. The itching did not recur after the drug was discontinued.

An exploratory laparotomy revealed a common duct stone, which was removed. The patient died as a result of postoperative hemorrhage and local wound and peritoneal infection.

* From the Medical Division, Mount Sinai Hospital, Service of Dr. George Baehr.

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2. Kaposi, M.: Hauterkrankung bei Diabetikern-Dermatosis diabetica, Med. Wchnschr. **34**: 93-94, 1884.
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CASE 2.—A man, aged 26, a Negro, receiving arsphenamine for syphilis, developed vomiting and coincidental generalized pruritus, so severe that it prevented sleep. These symptoms increased in severity until his admission to the hospital four weeks later, in January, 1931. A fortnight before admission icterus and drowsiness set in. The liver and spleen were found to be enlarged. The laboratory examination revealed: a normal hematologic condition, an icterus index varying between 55 and 70, a prompt positive van den Bergh reaction, 2.5 mg of bilirubin per hundred cubic centimeters of blood; cholesterol, 290 mg.; urea, 16 mg.; blood sugar, 75 mg.; amino-acid nitrogen, 7.2 mg.; a negative blood Wassermann test; Kahn test, 2 plus. The urine contained bile and bilirubin in increased amounts.

Oral doses of 0.001 Gm. of ergotamine were administered three times a day for three days. Definite improvement in the intensity of itching was noted after the third dose. Sleep was no longer disturbed. After the third day the pruritus ceased, never to recur.

The toxic degeneration of the liver following arsphenamine therapy subsided in six weeks, when the patient left the hospital well.

CASE 3.—A man, aged 46, entered the hospital in June, 1930, with a history of weakness and palpitation for two months, epistaxis for three weeks, and gross hematuria for one week before admission. For a month he had suffered continuous itching, day and night. The physical examination showed scratch marks over the entire body, with scattered small furuncles due to infection of the scratch marks. Large irregular masses were palpable in both flanks. Laboratory examination revealed: severe anemia, with hemoglobin 44 per cent; red blood cells, 1,190,000; fixation of urinary specific gravity at 1.008, and albuminuria. Blood urea varied between 114 and 82 mg. per hundred cubic centimeters of blood; blood calcium between 6.9 and 6.4. The blood pressure varied between 190 and 158 systolic and 96 and 88 diastolic.

Ergotamine in oral doses of 0.001 Gm. was administered three times a day for six days. On the first day amelioration of the intensity of itching was noted one hour following the evening dose. On the second and third days more definite remission of the itching was noted. Subsequently, under treatment, the itching completely abated, not recurring after discontinuation of the drug.

The clinical diagnosis was bilateral polycystic kidneys with azotemia. The patient left the hospital, his renal condition unchanged, seven weeks after admission.

CASE 4.—A woman, aged 48, with a five year history of renal disease, entered the hospital in June, 1931, with complaints of weakness, polyuria, and vomiting of five weeks' duration. While in the hospital she developed generalized itching which caused sleeplessness. The clinical observations were mitral stenosis and uremia. The blood pressure was not elevated, reading 120 systolic and 70 diastolic. Laboratory examination revealed: severe anemia, with hemoglobin 44 per cent; red blood cells, 2,600,000; urinary fixation of specific gravity at 1.008, and albuminuria, blood urea varying between 56 and 75 mg. per hundred cubic centimeters of blood; blood calcium, 8.1 mg.

Ergotamine tartrate was administered orally in 0.001 Gm. doses three times a day for four days, with slight relief following the second dose and complete relief after four days' trial. The uremia remained unrelieved. The itching did not recur, despite discontinuance of the medication.

The patient failed to recover from the uremia and died suddenly one month after admission in an attack of coronary thrombosis.

COMMENT

The prompt relief from this distressing symptom following the oral administration of minute doses of the drug cannot be attributed to metabolic changes. The basic disorder remains unaffected by the medication. Regardless of the exact nature of the original disturbing factors, which are undoubtedly different, in azotemia and in icterus, the drug acts by depressing the sympathetic nervous system. According to Youmans and Trimble,[5] exhibition of the effects of ergotamine on various parts of the sympathetic nervous system implies the existence of heightened tonus of that system, as normal individuals under basal conditions in whom this system is presumably inoperative do not manifest certain actions of this drug. The diminished sensitivity of the vegetative nervous system persisted indefinitely in my cases, there being no recurrence of the itching.

The absence of parallelism between the incidence and the severity of the pruritus in cases of jaundice and azotemia and chemical observations is best explained on the basis of individual variability in sympathetic nervous system tonus.

The drug is best discontinued as soon as relief is obtained. Prolonged use of the drug is attended by dangers of ergotism. In the presence of severe liver disease the question of the possible hepatotoxic action of the drug naturally arises. In this connection Bauer and Wozasek[6] have noted a decreased alimentary galactosuria in a normal individual and in patients with liver disease under the influence of ergotamine and have stated that they have observed improved liver function after its use.

SUMMARY

1. Ergotamine tartrate in oral doses of 0.001 Gm. is a useful antipruritic in hepatic and renal disease.

2. Pruritus of hepatic and renal origin is therefore probably the result of increased irritability of the sympathetic nervous system.

5. Youmans, J. B., and Trimble, W. H.: Experimental and Clinical Studies of Ergotamine, Arch. Int. Med. **47**: 612 (April) 1931.

6. Bauer, R., and Wozasek, O.: Ueber den Einfluss von Ergotamin und Leberdiät auf die Leberfunktion, Wien. klin. Wchnschr. **43**: 1337 (Oct. 30) 1930.

A CASE OF RESPIRATORY PARALYSIS IN POLIOMYELITIS SUCCESSFULLY TREATED IN A RESPIRATOR

JOHN FAVILL, M.D., AND THOMAS L. FENTRESS, M.D., CHICAGO

This case report is presented for two reasons: First, it describes, as far as we know, the third case of recovery from the respiratory paralysis of poliomyelitis by treatment in a Drinker respirator.[1] Second, many problems and details of the management of such a case are new and a record of them may assist in the management of future cases.

REPORT OF CASE

F. McG., a woman, aged 25, a senior student nurse at St. Luke's Hospital, reported ill, Sept. 9, 1930. The previous day she had developed a slightly sore throat and complained of pain in the back of the neck, which had later shifted to the right thoracic region. There was cough, painful respiration and a chilly sensation with a temperature of 103.6 F. Respirations were 24, and there were fine, bronchial râles throughout, most marked at the right base, where there was a slight pleural rub. The following day she had a chill, had a temperature of 101 F., and vomited. The white blood count was 9,400.

The third day, severe headaches developed. The right lung was clear, but the left was full of medium râles. A roentgen examination showed the diaphragm elevated on the right. Vomiting was projectile at times, and the patient moved in bed with difficulty. Respirations were 40; the pulse was 90 and the temperature 101. In the evening a neurologic consultation was requested. We found engorged retinal veins, stiff neck, slight left central facial paresis, absent abdominal reflexes, absent knee jerks, active achilles jerks, and normal plantar responses. There was extreme weakness of all leg muscle groups, except the flexors of the right foot and the gastrocnemii. A diagnosis of poliomyelitis was made, and lumbar puncture was done. Twenty-five cubic centimeters of faintly opalescent fluid was removed under slightly increased pressure. The cell count was 295 with 60 per cent lymphocytes and 40 per cent polymorphonuclears. As no convalescent serum was available, 9 cc. of normal human serum was injected into the subarachnoid space. Some respiratory difficulty followed during the night.

On the morning of the fourth day, the achilles jerk was absent on the left and just obtainable on the right. Some weak-

1. First case, Shambaugh, G. E., Jr.; Harrison, W. G., Jr., and Farrell, J. I.: Treatment of the Respiratory Paralysis of Poliomyelitis in a Respiratory Chamber, J. A. M. A. **94**: 1371-1373 (May 3) 1930. Second case, Drinker, Philip; Shaughnessy, T. S., and Murphy, D. P.: The Drinker Respirator, ibid. **95**: 1249-1253 (Oct. 25) 1930.

ness was noted in both arms. Respirations became shallow and gasping. The diaphragm and intercostals were obviously affected, and the accessory muscles of respiration in the neck were doing much of the work. Definite cyanosis had developed. The voice was weak, and swallowing fluids caused some choking. Ten cubic centimeters of antistreptococcus poliomyelitis serum was given. At 4 p. m. apnea appeared and persisted. Artificial respiration was administered manually for about five minutes before the patient was placed in the respirator. Improvement was rapid. A negative pressure of 16 on the manometer was found to work satisfactorily. Seventy-five cubic centimeters of convalescent serum was injected intramuscularly that evening. While out of the machine for from one to two minutes during the injections, respiration was fair. The next day the patient felt much better although the temperature reached 104 F. Intramuscular injections of mixed normal and convalescent serum and antistreptococcus poliomyelitis serum were given.

On the sixth day the temperature fell to 99.6 F. Injections of convalescent serum totaled 40 cc. For two minutes the patient breathed fairly well out of the machine but required oxygen and artificial respiration for the following six minutes before she could be replaced. The following day she was given 20 cc. of convalescent serum. The temperature was 100.4 F.

The eighth day 65 cc. of human serum, which although not "convalescent" had been found to be potent in protecting experimental animals against poliomyelitis virus, was injected. The temperature was normal for the first time. On the tenth day the patient developed a moderately severe serum reaction with fever of 100 F. Splints were applied to both legs on the advice of an orthopedic consultant, and these relieved much of the patient's discomfort.

During the next three weeks there was little change in her condition except for gradual improvement in the movement of the forearms and the diaphragm. She was constantly in the respirator except for the brief moments required for routine care. Three minutes out of the machine was sufficient to cause cyanosis, and once syncope occurred. Involuntary defecation and urinary incontinence developed. No attempt was made to increase the length of the periods out of the respirator, but the negative pressure was gradually reduced from an initial 16-20 to 8-10.

October 9, one month after the onset of her illness, the patient was able to remain out of the respirator for fifteen minutes. From that time on, the periods out of the machine were gradually increased in length so that three weeks later she was able to stay out for seventeen hours at a stretch. Daily exercises in salt water in the Hubbard tub were begun at this time. The next step was to train the patient to sleep out of the respirator. Reducing the negative pressure to zero awakened her, and it was not until two weeks later that she slept for three hours in bed.

As we continued to encourage the patient to remain out of the respirator, it was noted that, after an unusual effort, in addition to muscle fatigue, she complained of severe headache, rapid pulse, dyspnea, and mucus which she was unable to expel. Involuntaries were most likely to occur at these times. Mucus could usually be controlled by increasing the negative pressure in the respirator.

December 16, fourteen weeks after the onset of her illness, the patient was taken out of the respirator, as we then believed for good. During the next three weeks, her pulse averaged from 130 to 150 and respirations from 30 to 48. Mucus became much more troublesome and was not relieved by atropine. Headache was frequently present. January 9, after twenty-four days out of the respirator, the patient passed a very bad night and was at times irrational. At 7 a. m. she became very cyanotic, almost pulseless, and unconscious, and had a slight convulsion. She was immediately returned to the respirator and given caffeine hypodermically. Recovery was prompt. The next day she was still exhausted but had no other complaint than mucus which she could not raise. At this time hyperventilation with positive pressure was first tried. It was found to be much more efficient than merely increasing the customary negative pressure.

After this brief setback, we began gradually to increase the length of the periods out of the respirator. By using hyperventilation with positive pressure as required, we found it possible to avoid the symptoms which she had complained of the first time. Progress was so rapid that three weeks later she was able to leave the machine permanently.

The further care of this patient was chiefly an orthopedic problem and beyond the scope of this paper. Suffice it to say that when she was finally discharged from the hospital, June 3, 1931, her breathing muscles and arms were apparently normal, although there was a very considerable residual paralysis in the legs and trunk.

COMMENT

In looking back on this case, it is striking how slow we were to appreciate the value of hyperventilation with positive pressure in combating excessive mucus and congestion. By the prompt use of this method, the patient is spared much discomfort, and we believe that the dangers of pulmonary complications are diminished.

During the process of gradually freeing the patient from the respirator, such symptoms as headache, accumulation of mucus, increased tendency to involuntaries, tachycardia, and dyspnea should at once suggest that the patient is being pressed unduly. In our case, by paying proper attention to such symptoms, the sudden relapse on January 9 could probably have been averted.

It would have been of interest to follow the vital capacity as done by Shambaugh and his associates in their case and to have data on the blood gases, alkali reserve, and the like. This unfortunately was not done. However, it seems most likely that the train of symptoms mentioned previously was due to a state of chronic anoxemia.

This case demonstrates that long periods in the respirator are quite practicable. Our patient was in the machine for ninety-five days the first time and after her relapse for twenty-one days more.

CONCLUSIONS

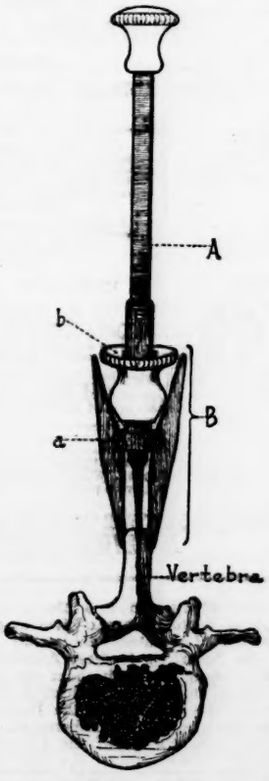
1. A recovery from the respiratory paralysis of poliomyelitis by treatment in a Drinker respirator is reported.

2. Some of the problems arising in the management of such a case are discussed in the hope that a record of them may be of assistance in the treatment of future cases.

8 South Michigan Avenue.

A SPECIAL BISECTING OSTEOTOME *

J. DEWEY BISGARD, M.D., CHICAGO



Special bisecting osteotome.

The inability to bisect accurately the vertebral spinous processes with the ordinary osteotome in the performance of an Albee spinal fusion operation is, no doubt, generally appreciated. To overcome this difficulty and to engage, center and control properly the direction traversed by an osteotome, a simple and efficient device was evolved with the assistance of V. Mueller and Company, Chicago. It consists of an osteotome (*A*) mounted and centered in a grasping device (*B*). The grasping blades (*a*) are made to clutch firmly the tip of the spinous process by the wedging action of the cone-shaped button (*b*). Controlled by this fixation, the cutting blade of the osteotome cannot deviate from its course as it is driven into the spinous process. Consequently, as has been demonstrated by repeated clinical trials, the spinous processes are bisected with marked precision and accuracy. The inherent advantages can be readily appreciated.

950 East Fifty-Ninth Street.

* From the Division of Orthopedics, Department of Surgery, University of Chicago.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

H. A. CARTER, Secretary.

HEALTH BUILDER NOT ACCEPTABLE

The Health Builder, manufactured by the Sanitarium Equipment Company, Battle Creek, Mich., is claimed to be a "mechanical means for administering massage and vibratory exercise."

The Health Builder consists essentially of an electric motor driving an oscillating mechanism which transmits a vibratory motion by means of a belt, or applicator, to the user.

In a pamphlet entitled "Keeping Fit in Fifteen Minutes a Day," copies of which have been distributed freely by the manufacturer at conventions, among others appear the following objectionable claims for the device:

Typical "patent medicine" testimonials headed "Wonderful for Constipation," "Great for Reducing Weight," and "Health Authority Endorses It."

On another page: "Promotes growth of the hair by stimulating the blood circulation of the scalp."

On the following page: "In cases of paralysis of the arms, simply wrapping the narrow applicator around the arm throws all the muscles into a vigorous exercise, and gives a massage to the deep muscles that cannot be duplicated with the human hand."

Again in another passage: "The Wide Applicator is used and will be a very good kidney and liver stimulant, and also very effective in rheumatism, constipation, *hemorrhoids*", and "Especially indicated in cases of round shoulders."

From a further paragraph: "This is a treatment that will be very beneficial in the treatment of coughs, colds, or *any bronchial or asthma* trouble."

Again: "Excellent in paralysis, cold feet and for relief of pain in the lower leg due to prolonged standing."

The firm has not submitted scientific evidence supporting these claims. Further, an investigation of mechanical exercisers, conducted by a special committee of the Council on Physical Therapy, brought forth no evidence which would justify or substantiate the claims quoted.

The Council on Physical Therapy condemns the sale of mechanical exercisers to the public for the following reasons:

1. Volitional effort is not encouraged.
2. The same results could be accomplished without an apparatus.
3. Treating only one part does not give any of the advantages of general exercise.
4. The use of such apparatus is monotonous and the patient loses interest in treatment.
5. The effect is that of mechanical massage and lacks the physiologic benefits of exercise.

The Council on Physical Therapy of the American Medical Association declares the Health Builder unacceptable for inclusion in its list of accepted devices for physical therapy because:

Rule 5. The firm advertises claims that are misleading, exaggerated or unwarranted.

Rule 6. The firm's advertising and descriptive matter fails to give adequate warning of the dangers associated with its use.

Rule 8. The firm uses an objectionable name for the apparatus.

LISTERINE

AN EXAMPLE OF BOTTLED PSYCHOTHERAPY

THE ODOR AND TASTE OF THYMOL
WITH A LITTLE *OF* THIS *AND* THAT

The "formula" given on the carton

Constituents.—Thyme, eucalyptus, baptisia, gaultheria and mentha, of each one part; boric and benzoic acids, twenty-nine parts; ethyl alcohol, two hundred and fifty parts; water to make one thousand parts.

LAMBERT PHARMACAL COMPANY.

The AMA LABORATORY FOUND THAT THE FOLLOWING GIVES A SOLUTION PRACTICALLY IDENTICAL (Chemically and Bacteriologically) WITH LISTERINE:

Boric Acid	23.4 Gm.
Benzoic Acid	0.4 Gm.
Alcohol (94%)	280.0 cc.
Menthol	0.375 Gm.
Thymol	0.75 Gm.
Eucalyptol	0.8 cc.
Methyl salicylate	0.1 cc.
Baptisia (Wild Indigo) Fluid Extract NF	10.0 cc.
Water to make	1000.0 cc.

WHAT PROGRESSIVE PHYSICIAN WOULD ATTEMPT TO WRITE SUCH A POLYPHARMACEUTICAL PRESCRIPTION!

This illustration and the illustration on the opposite page are reduced reproductions of two of the posters shown in the A. M. A. Chemical Laboratory exhibit at the Eighty-Second Annual Session of the American Medical Association at Philadelphia in June, 1931. Ascertaining the truth about the composition of patent and proprietary remedies and telling it through THE JOURNAL, the Council on Pharmacy and Chemistry or the Bureau of Investigation is a very important function of the Laboratory. These posters portray one of the recent undertakings of the Laboratory.

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

JOLLY TIME HULLESS POPCORN
(Guaranteed to Pop)

Manufacturer.—American Popcorn Company, Sioux City, Iowa.

Description.—Canned popcorn kernels with a proper moisture content for good popping.

Manufacture.—To assure the quality of the product, popcorn seed of northwestern Iowa is selected from each year's crop; the raising and curing of the corn is supervised and the preparation of the popcorn kernels for final packing carefully controlled.

The seed popcorn is distributed to experienced growers who contract to raise the crop. The popcorn for popping purposes is harvested after the first killing frost. The husk is left on the ear to prevent damage during "curing." The moisture content approximates 20 per cent. Foreign material is removed by air blast, and rotted or imperfect ears are sorted out. The sorted corn is stored in specially constructed wire lined cribs with air passages until the moisture content of the ears is reduced to the requirements of subsequent processing as shown by laboratory tests for moisture and popping volume. At this time the corn is again sorted on belts to remove ears damaged during the drying, is conveyed for from seven to ten days through air currents circulated by fans, and dried to approximately 12 per cent moisture content, that producing maximum popping volume.

The dried ears are sorted, and shelled in "shellers" constructed so as not to injure the bran layers, which, if cracked, would destroy the popping quality. The shelled popcorn is separated from the cobs and chaff by air blast and separating machines, is graded as to size, and is automatically packed in tin cans, which assure constant moisture content and permanent popping quality.

Chemical Composition (submitted by manufacturer).—

	per cent
Moisture	11.4
Ash	1.4
Fat (ether extract)	3.9
Protein (N × 6.25)	11.0
Crude fiber	2.4
Carbohydrates (by difference) other than crude fiber	69.9

Calories.—3.59 per gram; 102.0 per ounce.

Claims of Manufacturer.—A good quality popcorn, guaranteed to pop after years of storage.

PIXIE STRAINED CARROTS

(Mildly seasoned with salt)

Manufacturer.—Fruit Belt Preserving Company, East Williamson, N. Y.

Description.—Canned, sieved carrots containing in large measure the mineral and vitamin content of the raw carrots used: contains a small amount of added salt.

Manufacture.—The carrots from growers in the immediate vicinity are usually canned within a few days after harvesting, although occasionally they are held in cold storage. The carrots are steamed or blanched to soften the outer surface, rotated and washed in a peeling machine lined with carborundum to remove the skin layer; any remaining spots are cut off after leaving the machine. They are diced by machine, washed with water sprays, inspected on a picking table, where defective pieces are removed, and then placed in a nickel pressure kettle equipped with a perforated steam coil. A small amount of water is added, live steam is admitted and the air vented off. The carrots are steam cooked in a water vapor atmosphere, are flowed into an enclosed hopper containing a steam jet and a vent to assure a water vapor atmosphere only and then into an enclosed sieving machine containing an atmosphere of water vapor. The sieving machine in a monel metal screen cylinder having perforations of twenty-thousandths inch diameter with a revolving spiral which breaks down the fibrous material and forces the carrots through the screen. The coarse fiber passes out at the far end of the cylinder and is discarded. The comminuted mass falls into a receiver with a water vapor atmosphere, passes into an open kettle for heating and concentration or dilution to desired consistency, and is pumped to filling machines. The cans are filled to leave practically no air space, are capped and then autoclaved for forty minutes at 115 C.

Ordinarily the diced carrots are canned before sieving; the canned product is used for the sieving operations at a later date. The diced carrots are packed in No. 10 tins, covered with boiling water, placed in a water bath at 82 C. and exhausted of air under reduced pressure which is protective of the vitamin content. The cans are closed and processed for sixty-five minutes at 115 C. and then immediately cooled.

A small amount of salt is added to each can.

Chemical Composition (submitted by manufacturer).—

Specific gravity 20 C./20 C	1.03
	per cent
Moisture	93.4
Total solids	6.6
Ash	0.6
Fat (ether extract)	0.1
Protein (N × 6.25)	0.5
Crude fiber	1.3
Carbohydrates other than crude fiber (by difference)	4.1

Calories.—0.19 per gram; 5.4 per ounce.

Vitamins.—This canned sieved carrots is prepared in an atmosphere of water vapor to protect the vitamin content of the raw materials. The natural vitamin content consequently is largely retained or so far as is possible by present commercial sieving and canning methods.

Claims of Manufacturer.—The sieved carrots are recommended for infants, children, convalescents and special diets; they require only warming before serving. The carrots are scientifically prepared to retain to a maximum degree, or so far as is possible by present commercial sieving and canning methods, the natural mineral and vitamin values of carrots.

THE BACTERIOLOGY of LISTERINE
OR
Was the LANCET REPORT reliable ?

According to the LANCET (Lond) Report:
"The actual number of micro-organisms killed in 15 seconds by undiluted antiseptic exceeds that claimed by manufacturer," ie, 200,000,000 in 15 seconds.

SUCH A STATEMENT MEANS LITTLE

The LANCET Report does not bring out what the A·M·A Report does:

DILUTED LISTERINE IS NO MORE BACTERICIDAL THAN WATER . . .

EVEN FULL-STRENGTH LISTERINE IS AN EXCEEDINGLY WEAK GERMICIDE

According to TWO COMPETENT BACTERIOLOGIC INVESTIGATIONS, the "Phenol Coefficient" of Listerine is ridiculously low —— 0.022

The above poster illustrates several of the points brought out in the bacteriologic part of the Listerine report. The poster on the opposite page illustrates that the "formula" given on the Listerine carton is essentially secret, as Listerine cannot be prepared by following it.

WALSH'S KEW BEE BREAD

Manufacturer.—Walsh Baking Company, Evansville, Ind.

Description.—A white bread made by the sponge dough method.

Manufacture.—The sponge dough ingredients, 70 per cent patent flour Northwest wheat and 65 per cent patent flour of Southwest wheat, water, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The sponge dough is fermented for from four to five hours, after which are added flour, water, salt, sucrose, lard, and sweetened condensed skim milk to make the completed dough, which is cut into pieces of desired weight. The pieces are fermented for a short time, molded into loaf form, panned, further fermented, baked for from thirty to thirty-five minutes, cooled, and wrapped in wax-paper.

The factory, equipment and storage rooms are kept in strictly sanitary condition.

Chemical Composition (submitted by manufacturer)

	per cent
Moisture (entire loaf)	34.4
Ash	1.0
Fat (direct ether extraction method)	0.7
Protein (N × 6.25)	9.1
Crude fiber	0.1
Carbohydrates (by difference) other than crude fiber	54.7

Calories.—2.62 per gram
74.4 per ounce

Claims of Manufacturer.—A bread of good quality.

SWAN'S DOWNEES ROLLS

Manufacturer.—Swan Brothers, Knoxville, Tenn.

Description.—White rolls made by the sponge dough method.

Manufacture.—The sponge dough ingredients, 80 per cent patent flour of Southwest wheat, water, salt, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The sponge dough is fermented for from four to five hours, after which are added flour, water, sucrose, lard, powdered skim milk, butter and salt to make the completed dough, which is cut into pieces of desired weight. The pieces are fermented for a short time, molded into loaf form, panned, further fermented, baked for from thirty to thirty-five minutes, cooled, and wrapped in wax-paper.

The factory, equipment and storage rooms for the materials used are kept in strictly sanitary condition.

Chemical Composition (submitted by manufacturer).—

	per cent
Moisture (entire rolls)	32.7
Ash	1.5
Fat (ether extract)	7.0
Protein (N × 6.25)	9.3
Crude fiber	0.4
Carbohydrates (by difference) other than crude fiber	49.1

Calories.—2.97 per gram; 84.3 per ounce.

Claims of Manufacturer.—Rolls of good quality.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - - Chicago, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Seven dollars per annum in advance

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SATURDAY, NOVEMBER 14, 1931

HUMANITY IN THE HOSPITAL

The address by Dr. Joseph Brennemann on "The Human Side of the Hospital," printed elsewhere in this issue of The Journal,[1] merits more than cursory consideration. Many a medical leader has emphasized the fact that increasing science in the practice of medicine has tended to interfere considerably with its appreciation of the human equation. Indeed, the chief reason for opposition to the mechanization of medical practice has been the realization by physicians that overstandardization interferes with the care of the patient as an individual human being and tends to consider him as a composite of degenerated organs and disordered systems.

Many a hospital board has been disturbed by the apparent loss of good will on the part of the community that it serves without realizing that its employees at the door have apparently never heard of the idea of service. Many a patient and many a relative of patients have been antagonized by an insolent attendant at the desk or a discourteous employee at the telephone. The hospital that employs an uneducated clerk or the disabled parasite of some member of the board to meet its incoming guests makes an error of technic that is certain to be reflected on the balance sheet.

Rigid routine takes little account of variations in human temperament or personal disabilities. The hospital that is governed by unvarying routine is, therefore, not a hospitable hospital. It is taking care of robots and not of human beings. The routine that demands the awakening of all patients at 5:45 in the morning, regardless of their need for rest, is a perfect example of the dangers inherent in the militaristic system. Dr. Brennemann's citation of this particular point will be sympathetically reechoed by every person who has suffered under its enforcement.

The present period is one of education. Leaders have realized that much more can be accomplished through education and by taking the patient into confidence than can possibly be achieved by dictatorial methods. The scientific atmosphere is strange to the uninformed mind. In a recent conference on hospital service, the superintendent of a Pennsylvania institution displayed a group of pamphlets circulated by his hospital to the community, explaining to the uninformed the reasons for extra charges for the use of the operating room, for laboratory service and for similar extras on the patient's bill. Reasoning human beings seldom protest when they are informed. The solution to the hospital's problem would seem to be the development of some form of publicity that would enable the average man to know the why and wherefore of modern medical and hospital methods. Large institutions and large corporations employ specially trained individuals for this purpose. Hospitals might be able to find among their employees some one who could undertake a similar service, particularly for them.

1. Miscellany, page 1487.

VENTILATION

In 1913, the governor of the state of New York appointed a state commission on ventilation, which published its report in 1923. At that time, a reorganization of the state government failed to provide for a continuance of the commission. It was then reconstituted on the invitation of the Milbank Memorial Fund as the New York Commission on Ventilation. This commission began its work in 1926, and its final report has just become available.[1] The report is of great significance since it indicates that many municipalities and states are now attempting to conform to obsolete regulations requiring the installation and maintenance in school buildings of systems of mechanical ventilation which have been shown to be not only unnecessary but perhaps even a menace to health. Twenty states[2] require that there be an air supply of 30 cubic feet per minute for each person, a condition that can be obtained only by mechanical ventilation involving the use of fans. Such systems are not only costly but may produce drafts and overheating.

The point of view regarding ventilation has changed during the past generation. It was thought at first that the only bad air was that which contained more carbon dioxide than it ought to, and less oxygen than outside air. The modern point of view is that ventilation is required primarily to remove excess heat given off by the human body, and thus to maintain a comfortable atmosphere. Except where air contains poisons or dust due to imperfect combustion or industrial processes, the problem of ventilation is a physical rather than a chemical problem. Moreover, in small rooms or in large auditoriums containing many people, the air may become

1. School Ventilation: Final Contribution of the New York Commission on Ventilation, C.-E. A. Winslow, chairman, Rufus Cole, Dwight D. Kimball, Frederic S. Lee, George T. Palmer, Earle B. Phelps and Edward Lee Thorndike; Bureau of Publications, Teachers College, Columbia University, New York City, 1931.

2. The twenty states that still retain regulations concerning ventilating devices based on obsolete notions are Florida, Idaho, Illinois, Indiana, Maine, Massachusetts, Michigan, Montana, New Jersey, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Utah, Vermont, West Virginia and Wisconsin.

unpleasantly contaminated by odor. Thus, a certain amount of movement of air is necessary for suitable ventilation. The conclusions of the New York Commission on Ventilation state succinctly the present views concerning factors involved in good ventilation:

1. The major objectives of schoolroom ventilation shall be the elimination of heat from the body surface without the production of objectionable drafts. This means the maintenance of a room temperature of 65 degrees Fahrenheit in corridors, gymnasiums and shops; of 75 degrees in swimming pools and adjacent dressing rooms, and of 68 degrees in all other occupied rooms.

2. The avoidance of overheating is of primary importance for the promotion of comfort and efficiency and the maintenance of resistance against disease. Sources of direct radiation, therefore, shall be so designed or protected as to prevent overheating of persons in adjacent seats.

3. All classrooms shall have at least 15 square feet of floor space and 200 cubic feet of air space per pupil and shall have a system of heating and ventilation which shall provide means of air supply and exhaust capable of avoiding unpleasant odors and of avoiding, without chilling drafts, an increase of room temperature above 68 degrees Fahrenheit.

4. Such ventilation shall be accomplished by any means which will attain satisfactorily these specified results. For the average school, favorably located, window-gravity (open-window) ventilation seems to be the method of choice on grounds of comfort and economy.

5. Every schoolroom used for instruction, study, assembly, and physical recreation shall be provided with at least one thermometer of a grade that will give a reading accurate to within one degree Fahrenheit. The thermometer should be so located as to give a representative reading of temperature at the breathing place of the pupils.

6. Such an approved system of ventilation shall be maintained in operation whenever school is in session.

Legislation is almost invariably behind science in its attempts to provide suitably for public health and safety. The development of knowledge or of new technic and apparatus may not be applied under legal requirement before several years, sometimes not even for a decade. New schools are constantly being erected, and authorities are expending considerable sums to meet legal requirements which are scientifically obsolete. In a period of national economy it would seem to be desirable that legislators attempt, as soon as possible, to free taxpayers from such unnecessary expenditure by revocation or amendment of existing legislation.

SKIN TEMPERATURES IN CHILDREN

The familiar fact that observations of the temperature of the body are only less frequent in medical practice than those of the pulse or the tongue is a sufficient reason for serious consideration of the mechanisms of heat production and dissipation in the body and the regulation of these processes. Prior to the introduction of thermometers the acquisition of knowledge in this domain depended largely on sensations and was slow, and the conclusions were sometimes fallacious. The introduction of accurate methods of measuring heat in the body therefore initiated great progress. The observation was made that despite wide variations in the environmental conditions such as are represented by the height of summer and the depth of winter the temperature of the human body remains approximately constant. Deviations from the normal body temperature are therefore regarded as fundamental physical signs of disease; and the clinical thermometer has become an indispensable aid to the practitioner.

Until quite recently measurements of temperature on man have been confined to the interior of the body or to some equivalent, such as readings of the thermometer in the mouth, rectum, groin, axilla, vagina or freshly voided urine. These data represent the results of the equilibrium between heat production and heat loss; they do not betray which group of factors happens to be dominant at any moment, nor do they demonstrate the disturbance of any agency in the remarkable regulation. Benedict [1] has pointed out that under normal conditions of rest about 75 per cent of the heat lost from the body is from the skin, chiefly by radiation, and 25 per cent is by vaporization of water from the lungs and skin. Hence the measurement of skin temperature of itself becomes suggestive in studying the conditions of heat loss. Determinations of the effects of exposure to cold and of exercise on the skin temperature also are useful, since they enable an approximate estimate of the heat lost by radiation to the environment. Thus far in physiology emphasis has been laid in large part on rectal temperatures. In recent years, however, importance has been attached to the skin temperature as a factor that may prove of great value, not only in physiology but likewise in pathology.[2] We may bear in mind, as Talbot [3] has noted, that if the protective mechanism against cold is broken down or the environmental changes are too great, the person becomes more susceptible to infections, the metabolism is slowed down, bodily functions become less efficient and, finally, when the body temperature remains approximately constant, small changes of temperature are observed under some conditions. Probably, however, the heat-regulating apparatus of the body is so delicately adjusted that the normal variations in body temperature are kept within a narrow range. Talbot adds, however, that this is impossible for man under certain climatic conditions unless he provides some artificial protective covering, such as clothing. Progress in the study of skin temperatures has been made possible by the development of a simple technic for the measurement of skin temperature, based on the well known thermo-electrical principle.

The problems of skin temperatures are particularly significant in early life; hence the importance of the investigation just published by Talbot from the Harvard Medical School and forming a separate part of the October issue of the *American Journal of Diseases of Children*. Many of their results parallel those of F. G. Benedict and others on adults. There is a local varia-

1. Benedict, F. G., and Parmenter, Hazeltene S.: Human Skin Temperature as Affected by Muscular Activity, Exposure to Cold, and Wind Movement, Am. J. Physiol. **87**: 633 (Jan.) 1929.
2. Cobet, R.: Ergebn. d. Physiol. **25**: 439, 1926.
3. Talbot, F. B.: Skin Temperatures of Children, Am. J. Dis. Child. **42**: 965 (Oct., part 2) 1931.

tion of the temperature of the skin over different parts of the body, even in normal children, the temperature of the trunk being highest, the face next and the extremities lowest. The temperature of the feet tends to be lower than the temperature of the hands. Surrounding temperature has a definite effect on the temperature of the skin of the body even when the child is clothed. The cooler the room is, the lower the temperature of the skin. There is also a seasonal effect on the temperature of the skin. Noteworthy is the rapid loss of heat from the surface of the body on exposure. This affects the face least, the body next and the extremities most. There is a greater variation in the reaction of the extremities to different surrounding temperatures than in other parts of the body. This suggests that the extremities act as safety valves for the conservation or the elimination of heat.

These facts cannot fail to have some bearing on the choice and adjustment of clothing—a subject that has heretofore been considered less enthusiastically from physiologic points of view than otherwise. Talbot found that in normal children the natural choice of clothing considered comfortable for everyday life usually compensates for temperature changes in the environment. Premature infants have long been known to require special consideration. As Talbot remarks, the fact that it is commonly necessary to supply external heat to maintain the body temperature of the new-born infant at the normal level is evidence that the heat-regulating apparatus is usually not fully developed at birth and is almost completely absent in the premature infant. The mechanism that maintains the body temperature at a uniform level must develop rapidly, for it appears to reach full efficiency in early childhood and possibly in infancy. In the premature infants, however, Talbot has supplied further evidence that the heat-regulating apparatus is not developed. The temperature of the skin of the premature infant, as well as that of the body, is affected directly by the surrounding temperature and to a greater degree than it is in normal babies. According to Talbot, among the factors that favor lowering of the body temperature in the prematurely born infant are the relatively great area of the heat-eliminating surface, i. e., the skin, as compared with body weight, the normal lack of subcutaneous fat, which prevents escape of heat from the more vital tissues of the body, the normally low production of heat by the organism itself, and the failure to increase this production by shivering, crying and other forms of exercise when the environmental temperature falls below that optimal for the child. Adequate protection against a rise in body temperature is also lacking in these "unfinished" children. When for some reason the heat production in the body increases, or when the environmental temperature is above the optimal level, there is no corresponding increase in the elimination of excess heat. The sweat glands do not function as efficiently as they do in the fully developed or "mature" new-born infant, and sometimes they do not act at all. All the newer scientific observations justify the long exercised clinical precautions directed toward careful maintenance of the body temperature of the new-born and the prematurely born infant.

Current Comment

THE A. M. A. CHEMICAL LABORATORY—TWENTY-FIVE YEARS

In 1906 the Board of Trustees directed the creation of a chemical laboratory in the headquarters of the American Medical Association. The chief function of the Laboratory was and is to aid the Council on Pharmacy and Chemistry in its consideration of proprietary products. In 1906 deceit was rampant; false formulas and improbable chemical statements were not uncommon. The Laboratory provided physicians with accurate scientific information. Today there is much less of such gross deception; the work of the Laboratory is devoted largely to the purely constructive work of standardizing or examining new remedies, most of them of complex composition. Shortly after its creation, the Laboratory broadened its activities to include examination of nostrums. The results have been published in the columns of THE JOURNAL first known as "Propaganda for Reform" but more recently as "Bureau of Investigation." Each year a limited number of original investigations are undertaken on topics which may aid in improving materia medica. At its inception the Chemical Laboratory employed only one chemist and an assistant—today it has four chemists, including the director (all Ph.D.'s), and an assistant, besides adequate secretarial and stenographic help. The congratulations of the medical profession are here tendered the Chemical Laboratory, which for a quarter of a century has served both physicians and the public for the advancement of medical science and the public health.

NOBEL PRIZE AWARDED TO WARBURG

The 1931 Nobel prize in medicine has been awarded to Prof. Otto Warburg, director of the Kaiser Wilhelm Institute for Cell Physiology at Berlin-Dahlem. Professor Warburg, born in 1883, the son of an eminent German physicist, trained in chemistry under Emil Fischer and in medicine at Heidelberg, has devoted practically his entire career in research to the study of biologic oxidations. Except for a period of interruption during the World War, his publications on this subject have been continuous since 1908 and cover almost all phases of the field. His theories have been based at all times on experiments, some of them most ingenious, and experimentally difficult, embracing knowledge gained in the disciplines of physics, chemistry and biology. These studies have in large measure centered around the fundamental hypothesis that cell oxidations occur through the catalytic agency of iron in complex organic combination. In the course of his work he has demonstrated the accelerating effect of iron on physiologic oxidations and has artificially pre-

pared organic iron compounds whose behavior resembles the natural respiration enzyme in all important respects. As he stated in his 1929 Herter lecture, "Although we know the class of substances to which the enzyme belongs, its exact chemical constitution is yet unknown. The task is now to find the iron-porphyrin not only similar to the enzyme but identical with it." The interest of the medical profession in Warburg's work has centered around his contribution to the metabolism of cancer cells beginning with his publications on this subject in 1924. These experiments demonstrated that, whereas most normal tissue cells burn sugar completely to carbon dioxide and water in the presence of an adequate supply of oxygen, cancer cells derive their energy in large part from the splitting of sugar into lactic acid. Although subsequent investigation has demonstrated the existence of certain other normal tissue cells which behave similarly to cancer cells, Warburg's original observations mark a definite positive contribution to our knowledge of the biologic properties of cancer. Perhaps not the least of Warburg's contribution has been the stimulus he has given to the study of cell respiration throughout the world. The Warburg technic of measuring tissue oxidations is being employed in some form in almost all laboratories where an interest in cell physiology exists.

PROPOSED RESTRICTIONS ON FOREIGN PHYSICIANS IN FRANCE

Foreign physicians are said to be more numerous in France than in any other country. The overcrowding of the profession in France was recently studied by a committee of the Academy of Medicine in Paris. The academy adopted a resolution demanding that parliament soon pass a bill which would require that the government diploma, which alone grants the right to practice, be awarded only to students who had pursued all their medical studies in France. A committee of the French senate has proposed a similar bill. Under the proposed legislation no one would be authorized to practice without a state diploma of doctor of medicine; furthermore, foreigners who have a diploma from a French university when applying for a state diploma would be required to have a certificate from a French secondary school, showing that they had passed special examinations in physics, chemistry and the natural sciences. This proposed bill would require all foreign physicians to be naturalized before they could practice in France or its colonies, and only those who had been naturalized five years would be eligible for appointment to a public position. Three months later another bill was introduced into the French senate which would modify the previous bill, in that foreign countries that permit physicians of French nationality to practice could demand the same privilege from the French government. However, foreigners who have French medical diplomas would still have to submit the initial requirements for a diploma in physics, chemistry and the natural sciences and take the final examinations. They could be exempted from examination in anatomy, physiology and the clinical courses. This bill would exempt from naturalization foreigners who are now practicing or who were studying medicine in France at the time this law would be enacted. There have been laws in France at least since 1892 placing certain restrictions on the practice of medicine by foreigners. Presumably the desire for more stringent restrictions in the right to practice medicine is the result of economic pressure.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 11:15 a. m. on Saturday over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week is as follows:

November 21. Do Needles Travel in the Body?

Five Minute Health Talks may be heard over Station WBBM of the Columbia Broadcasting System at 2:25 to 2:30 p. m. on Monday, Wednesday and Friday.

The program for the week is as follows:

November 16. Light Lightens Living.
November 18. The Sanitary Manicure.
November 20. Food and Disease.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Dr. Taylor to Deliver Colver Lectures.—Dr. Alonzo E. Taylor, director of the Food Research Institute, Stanford University, will give the fourth annual series of medical lectures under the Colver Lectureship of the College of Medical Evangelists, Los Angeles, November 17-19, on "General Relations of the Food Supply." The first lecture will be on "Relations of Population and Food Supply"; the second, "Relation of Cost of Food to Cost of Living," and the third, "Nutritional Competence of the Food Supply." The last lecture will be presented at a joint meeting of the Los Angeles County Medical Association and the Los Angeles County Dental Society.

Society News.—The Northern California Public Health Association was addressed, October 24, at the University of California, Berkeley, among others, by Dr. Karl L. Schaupp, San Francisco, on "Medical Problems of Health and Unemployment."——At the meeting of the Los Angeles Surgical Society, November 20, the speakers will be Drs. Charles T. Sturgeon on "Diverticula of Esophagus"; Clarence A. Johnson, "Benign Neoplasms of the Stomach," and William H. Daniel, "Failure of X-Ray Diagnosis of Tumors of the Rectum."——Dr. Joseph E. Moore, Baltimore, addressed the Los Angeles Society of Ophthalmology and Oto-Laryngology, November 9, on "Syphilitic Optic Atrophy."——The Pacific Physical Therapy Association will be addressed, November 18, by Dr. Thomas E. P. Gocher, San Francisco, on "Use and Abuse of Physical Therapy in the Treatment of Industrial Medical and Surgical Cases."——The Los Angeles County Medical Association was addressed, November 5, by Drs. Mark Albert Glaser on "Value of Encephalography and the Diagnosis of Cerebral Lesions"; John C. Irwin, "Cervical Cesarean Section by Transverse Incision," and Edwin Vincent Askey, Ernest M. Hall and Kenneth S. Davis, "Sarcoma of the Stomach." Mr. Buron Fitts spoke on "Problems of the District Attorney's Office."——At the November 10 meeting of the San Francisco County Medical Society, Drs. Edward H. Bolze, Jr., and John J. Sampson, among others, spoke on "Explosion Hazards in the Operating Room" and "Potassium Control of Arrhythmias in the Perfused Heart," respectively.

CONNECTICUT

Medical Society Donates Services for Unemployment Relief.—At a special meeting, November 2, of the Manchester Medical Association, which includes all the physicians in town, a resolution was adopted which provided that professional services would be given free to all those receiving aid from the town charities or relief committee. Each physician will be taken in rotation and answer house or office visits accordingly. An identification card to be presented to the physician called will be given to those expecting aid. The resolution further provides that the physicians donate to the relief committee the money set aside by the town for the medical care of the poor, a sum of $700, which will be used in other ways than for medical service. A committee of three physicians has been appointed to cooperate with the relief and town authorities. This method of relief will continue as long as the present relief committee is functioning.

DISTRICT OF COLUMBIA

Personal.—Dr. Leslie T. Gager, clinical associate in medicine at George Washington University Medical School, has been appointed professor and head of the department of medicine at Howard University School of Medicine.

Dr. Park Gives First Davidson Lecture.—The initial Davidson Lecture of the Medical Society of the District of Columbia will be given, November 18, by Dr. William H. Park, professor of bacteriology and hygiene, University and Bellevue Medical College, New York, on "Antipoliomyelitis Serum in Horses and Human Beings and Its Use in the Prevention and Treatment of Poliomyelitis." This lecture was established, May 1, 1929, in honor of Dr. Edward Young Davidson, who, when he was president of the society in 1916, "conceived and led to completion the movement" which provided the society's present building. In accordance with the resolution that provides for the establishment of the lecture and the preparation of a tablet in its commemoration, a tablet will be unveiled on the same day in the library of the society's building. Dr. William Gerry Morgan, formerly president of the American Medical Association, will present the address. The society appropriated $3,000 to endow in perpetuity the Davidson Lecture to be given biennially by a physician or other scientist who shall be nominated one year in advance by the executive committee. The speaker will be given an honorarium of $300.

ILLINOIS

Society News.—The fifty-seventh annual meeting of the Southern Illinois Medical Association was addressed in Olney, November 5-6, among others, by Drs. Louis R. Wayman, Murphysboro, on "Appendicitis in Childhood"; Charles A. Elliott, Chicago, "Management of Edema"; Robert F. Lischer, Mascoutah, "The Social Evil," and Millard F. Arbuckle, St. Louis, "Diagnosis of Acute Mastoiditis in the Absence of the Classical Signs and Symptoms."

Chicago

Personal.—Dr. Daniel H. Williams left more than half of his $100,000 estate to the National Association for the Advancement of Colored People in his will, it is reported. Other charitable bequests included $5,000 each to Meharry Medical College, Nashville, Tenn., and to Howard University, Washington, for scholarships. St. Elizabeth's Hospital, Chicago, received $2,000. Dr. Williams died, August 4.

University News.—Dr. Allen B. Kanavel addressed the Medical History Club of the University of Illinois College of Medicine, November 4, on "The Value of Medical History to the Student of Medicine." The Medical History Club meets on the first Wednesday of each month, and the Medical Research Club on the third Wednesday. Clinical conferences are held on the second and fourth Wednesdays.

IOWA

Personal.—Dr. John T. McClintock, junior dean and professor of physiology at the State University of Iowa College of Medicine, Iowa City, is in charge of the college during the absence of Dr. Henry S. Houghton, dean. Dr. Houghton is a member of a commission appointed to appraise and evaluate facts on foreign missions now on a tour of the Orient (THE JOURNAL, October 10, p. 1082).

Annual Medical Clinic.—The twentieth annual medical clinic of the State University of Iowa College of Medicine, Iowa City, will be held, November 20-21. The program includes clinics, ward walks, laboratory demonstrations and case presentations. Friday evening, Richard E. Scammon, Ph.D., dean of medical sciences, University of Minnesota, will give an illustrated address on "The Last Great Plague of London." A motion picture film by Carl G. Hartman, Ph.D., on "Parturition in the Monkey" will be shown. The Northwestern-Iowa football game will be an attraction, Saturday afternoon.

KENTUCKY

Society News.—Dr. William H. Witt, Nashville, Tenn., among others, addressed the Christian County Medical Society, Elkton, October 20, on "Importance of the History in Gastro-Intestinal Disease."——Dr. William Allen Pusey, Chicago, addressed the semiannual meeting of the Southwestern Kentucky Medical Association, Fulton, October 27, on eczema.——Dr. Louis Wallace Frank addressed the Jefferson County Medical Society, Louisville, November 2, on cancer of the uterus. Dr. Robert P. Ball, Harlan, will discuss rabies at the meeting, November 16.

LOUISIANA

Birthday Volume in Honor of Dr. Matas.—The October issue of the *American Journal of Surgery* was dedicated to Dr. Rudolph Matas in honor of his seventy-first birthday and the completion of fifty years in the practice of medicine. The volume is a collection of surgical essays written in honor of Dr. Matas, who, since 1928, has been emeritus professor of general and clinical surgery at Tulane University of Louisiana School of Medicine, New Orleans, from which school he graduated in 1880. Dr. Matas has been president of the New Orleans Medical and Surgical Association, Louisiana State Medical Society, American Surgical Association and Southern Surgical Association. He was editor of the *New Orleans Medical and Surgical Journal* from 1883 to 1895, and, in 1926, was the Henry Bigelow medalist of the Boston Surgical Society.

MARYLAND

Dr. Finney to Be Awarded Bigelow Medal.—Dr. John M. T. Finney, professor of clinical surgery, Johns Hopkins University School of Medicine, Baltimore, will be awarded the Henry Jacob Bigelow gold medal in February by the Boston Surgical Society. The award is based on scientific contributions to and distinguished services in the field of surgery. Dr. Finney will be the fifth recipient of the Bigelow medal.

Memorial to Dr. Baer.—The treatment pool in the Thomas Bowles Memorial Building, a new addition to the Children's Hospital School, Baltimore, was recently dedicated to the memory of the late Dr. William S. Baer. The pool is to be used for the treatment of infantile paralysis. Dr. Baer, an orthopedic surgeon, died, April 7. The Thomas Bowles Memorial Building was made possible through a gift of $300,000 by Mrs. Bowles in memory of her husband. It will be dedicated, December 1, and opened for patients, January 1.

Dr. Abel Resigns at Johns Hopkins.—The resignation of Dr. John Jacob Abel as professor of pharmacology at Johns Hopkins University School of Medicine has been announced. Dr. Abel, who has held this position since 1893, will devote his time to further pharmacologic research. He will continue to edit the *Journal of Pharmacology and Experimental Therapeutics*. In 1926, Dr. Abel was awarded the Willard Gibbs Medal by the Chicago Section of the American Chemical Society. He has conducted numerous researches on animal tissues and fluids and on the physiologic and therapeutic action of various substances. Dr. Abel's greatest achievement was his research paving the way for the isolation of epinephrine in pure form.

MASSACHUSETTS

Dr. Adrian Lectures at Harvard.—Dr. Edgar Douglas Adrian, Foulerton research professor of the Royal Society at Cambridge University, England, delivered a lecture at Harvard University Medical School, November 3. His subject was "Sense Organs and Nerve Cells."

State Board for Registration in Chiropractic.—According to the *New England Journal of Medicine*, the newspapers reported, October 20, that chiropractors were about to file an initiative petition seeking passage of a law for the establishment of a state board of registration in chiropractic. This board would consist of three persons to be appointed by the governor to pass on the qualifications of applicants desiring to practice as chiropractors.

Society News.—At the Eleventh District Public Health Institute, October 13, the speakers included Drs. Wilson G. Smillie, Boston, "White House Conference"; Wilson W. Knowlton, Boston, "Health Service in Your Own Home";

Herbert L. Lombard, Boston, "Adult Hygiene," and Harlan L. Paine, North Grafton, "Mental Hygiene."——Dr. Richard B. Cattell, Boston, addressed the Berkshire District Medical Society at Dalton, October 28, on "Carcinoma of the Colon and Rectum."——The Belmont Medical Society was addressed, October 30, by Dr. Martin J. English, Boston, on "Newer Aspects of Infant Feeding."——A symposium on infantile paralysis featured the meeting of the Suffolk District Medical Society, October 28; Drs. Gaylord W. Anderson, Tracy B. Mallory, Charles S. Kubik, Neil L. Crone, Ph.D., and Mr. Philip Drinker were on the program. Dr. John D. Adams, Boston, addressed the Middlesex South District Medical Society, October 28, on "Present Situation in the Treatment of Fractures."——The Norfolk District Medical Society was addressed, October 27, by Drs. John L. Morse on "Prognosis of Acute Endocarditis in Children"; Herrmann L. Blumgart, "Diuretics in the Treatment of Edema," and Louis M. Freedman, "Bronchoscopic Observations on Pulmonary Atelectasis."——Dr. Arthur T. Legg, Boston, addressed the South End Medical Club, October 20, on "Early Treatment of Infantile Paralysis."——A clinical program will feature the joint meeting of the Suffolk District Medical Society and the Boston Medical Library, November 18; the speakers include Drs. Chester S. Keefer on "Importance of Infection in Arthritis," and Henry Jackson, Jr., "Treatment of Malignant Leukopenia with Pentose Nucleotides."——The Massachusetts Psychiatric Society was addressed at its seventh annual meeting, October 30, by C. S. Slocombe, Ph.D., on "The Scientific Method in Motor Vehicle Administration."

MICHIGAN

Society News.—Dr. Henry D. Chadwick, Detroit, was elected president of the Michigan Tuberculosis Association at its annual meeting in Ann Arbor, October 16.——Dr. Frank Hinman, San Francisco, addressed a joint meeting of the Wayne County Medical Society and the Detroit branch of the American Urological Society, November 3, on "Classification of Urinary Infections in Line with the Practical Needs of the Clinician."——Dr. George H. Belote, Ann Arbor, addressed the Calhoun County Medical Society, November 3, on the treatment of syphilis.——Dr. Bernard Fantus, Chicago, addressed a joint meeting of the Saginaw and Bay county medical societies, October 28, on "Therapy of Colon Stasis."

Dr. Darling Honored.—In recognition of his long service in the practice of medicine, a bronze bust of Dr. Cyrenus C. Darling was presented to the University of Michigan, October 28, by Dr. Frederick G. Novy on behalf of Dr. Darling's friends. Although Dr. Darling has retired, he still retains his position as chief of staff at St. Joseph's Mercy Hospital. He became associated with the faculty of the university in 1890. In 1903 he was made acting dean of the dental college, a position he held for four years. In 1906 he was named professor of oral surgery and clinical professor of surgery. He is a former mayor of Ann Arbor and in 1926 was president of the Michigan State Medical Society. The bust was the work of Carleton W. Angell, campus sculptor.

Free Home for Incurable Cancer Patients.—According to newspaper reports, Mercy Hall, 312 Watson Street, Detroit, was opened, October 11, as a free home for incurable cancer patients too poor to pay for treatment. The institution will be operated by the Society of Perpetual Help, a group of five Detroit women, with no remuneration of any kind. These women will supplement the care of Detroit physicians, who, largely through the efforts of Dr. Charles E. Dutchess, chairman of the Commission for Cancer Control of the Detroit Board of Health and of the corresponding committee of the Wayne County Medical Society, have volunteered their services. The home was patterned after a similar one in New York. Only incurables are accepted.

MINNESOTA

Medical Examinations for Unemployed.—In an attempt to discover men and women who are frequently or generally out of work on account of physical disabilities that prevent their success as workers, medical examinations for the unemployed are being given by the Minnesota Employment Stabilization Research Institute with headquarters at the University of Minnesota. The institute was recently set up to make an intensive study of basic conditions of unemployment in Minneapolis, St. Paul and Duluth. Mental tests and tests for vocational interests, trade skill proficiencies and personality traits are being given in addition to the medical examinations to 4,000 unemployed persons who have registered at the institute. A study of industrial conditions and public employment offices in the three cities will also be made.

Society News.—The Red River Valley Medical Society was addressed, October 6, by Dr. Walter A. Fansler, Minneapolis, on "Rectal Difficulties in the Tuberculous"; a discussion of certain phases of tuberculosis was also given at this meeting.——Dr. Archibald W. Graham, Chisholm, among others, addressed the Northwestern Pediatric Society, October 10, on "Hypertension in Children and Its Effect on Eyesight."——A joint meeting of the Minnesota Radiological Society, the Iowa X-Ray Club and the radiologic section of the Wisconsin State Medical Society was held at the Mayo Clinic, Rochester, October 17. The principal address was delivered by Dr. Lewis Gregory Cole, New York, on "Correlation of the Roentgenologic Appearance with the Pathologic Changes of Gastric Ulcer."

NEW JERSEY

Health at Paterson.—Telegraphic reports to the U. S. Department of Commerce from eighty-two cities with a population of 36 million, for the week ended October 31, indicate that the highest mortality rate (18.8) appeared for Paterson and the rate for the group of cities as a whole, 10.9. The death rate for Paterson for the corresponding week last year was 14.3 and for the group of cities, 11.6. The annual rate for the eighty-two cities for the forty-four weeks of 1931 was 11.9 and the same rate appears for the corresponding period of 1930. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

NEW YORK

State Laboratory Distributes Toxoid.—Diphtheria toxoid is now being distributed to physicians by the state division of laboratories and research. Directions sent with the toxoid are based on the results of present experience with the optimum dosage, number of injections and interval between them. The best response to its use appears to be in children under 10 years of age. Physicians are requested to send reports of their results to the laboratory.

Society News.—At the twenty-fifth annual meeting of the fifth district branch of the Medical Society of the State of New York at the Marcy State Hospital, September 29, speakers included Drs. Kenneth R. McAlpin, New York, on "Pernicious Anemia: Differential Diagnosis and Treatment"; Charles W. Hutchings, Marcy, "Modern Methods of Treating Syphilis of the Nervous System"; Percival K. Menzies, Syracuse, "Compensation Problems Encountered in Surgical Practice," and Joseph Colt Bloodgood, Baltimore, on cancer.——Drs. Marshall Clinton, Buffalo, and James F. Rooney, Albany, addressed the eighth district branch of the Medical Society of the State of New York, October 1, on "Diseases of the Breast" and "Coronary Thrombosis," respectively.——Dr. Thomas H. Russell, New York, addressed the Medical Society of the County of Nassau, Mineola, October 27, on "Diagnosis and Management of Gastric and Duodenal Ulcers."

New York City

Second Harvey Lecture.—Dr. Edgar Douglas Adrian, Cambridge, England, will deliver the second Harvey lecture, November 19, at the New York Academy of Medicine, on "The Messages in Sensory Nerve Fibers."

Program for Prevention of "Colds."—Each of New York City's 1,600,000 school children received with his report card at the end of the first school month a message on the prevention of common colds. This is a part of the plan of the city health and school authorities, both public and parochial, to work with the parents of school children in the prevention of disease. They hope by this campaign of education to reduce the number of colds and the illnesses that follow them. The warning message sent to parents includes information on how to avoid colds, how they are spread and what to do for them.

Society News.—Dr. John S. O. Herrlin, Jr., addressed the Medical Society of the County of Queens, November 6, on "Infections of the Hand."——Dr. Henry C. Bazett, Philadelphia, addressed the New York Physical Therapy Society, November 4, on "General Principles Involved in the Use of Physical Therapy in Diseases of the Circulatory System."——The Haden Etching Club, formed last March by physicians and dentists who etch, began monthly meetings, November 4. The club plans to hold an exhibition in the spring. The secretary is Dr. Benjamin F. Morrow.——Dr. Gerard L. Moench addressed the Bronx Gynecological and Obstetrical Society, October 26, on "Factors to Be Considered in the Examination of the Infertile Couple."

Diphtheria Commission Dissolved.—The Diphtheria Prevention Commission of the New York department of health officially closed its three-year campaign with the resignation of Edward Fisher Brown as director, November 7, exactly three years after his appointment. The diphtheria campaign was financed mainly by the Milbank Memorial Fund and the Metropolitan Life Insurance Company. During its course more than 500,000 children were immunized, and both the mortality and the morbidity from the disease showed striking decreases. The average number of cases of diphtheria for the twenty-year period just preceding the beginning of this campaign was more than 10,000 a year, and the deaths averaged about 1,000. During 1930 there were 3,794 cases with 198 deaths. For the first ten months of the present year there have been 3,377 cases and 130 deaths, the health department reports. The campaign was conducted almost entirely along educational lines. The press and the radio broadcasting stations gave generous support and the message was spread further through social, business, welfare and religious agencies. The cost was about $140,000 a year. It is estimated that the economic loss averted amounts to approximately $10,000,000. Dr. Shirley W. Wynne, health commissioner, pointed out in his announcement, however, that there are about 700,000 children under 10 years of age in the city who are still not immunized.

NORTH DAKOTA

Society News.—At a meeting of the Sixth District Medical Society, Bismarck, October 8, Drs. Chester A. Stewart, Minneapolis, and William H. Bodenstab delivered addresses on childhood tuberculosis and the basis on which disabilities are determined for workmen's compensation, respectively.

Health Work in the Drought Area.—Twelve counties in North Dakota affected by the drought of 1930 have been organized into three units of four counties each, with the assistance of federal funds, to carry on health work for a period of nine months. A health officer is assigned to each district and a nurse to each county. Major projects include immunization, control of communicable disease, sanitation, and health education among various groups. The health officers appointed are Drs. Samuel J. Hillis, Berthold; Ingol M. Law, Halliday, and Laurence N. Serhus, Williston.

OHIO

Appointments at University of Cincinnati.—Glenn E. Cullen, Ph.D., has recently been appointed professor of research pediatrics at the College of Medicine of the University of Cincinnati. Other appointments announced are those of Drs. John H. Foulger, as associate professor of pharmacology, and Asher T. Childers and Louis A. Lurie, assistant professors of psychiatry.

Conference of Health Commissioners.—The twelfth annual conference of health commissioners of Ohio will be held in Columbus, November 18-20. Among the speakers will be Drs. Herbert M. Platter, Columbus, on "Mutual Ideals of the Medical Profession in Official Health Work and Private Practice"; Charles A. Neal, Columbus, "Contribution of Nonofficial Agencies to Public Health and Their Relationship to Official Service," and John E. Monger, Columbus, "Status of Diphtheria Immunization." Other subjects of addresses and conferences will be policies of public health nursing, sanitation of school buildings, food and milk sanitation, and registration of vital statistics.

OKLAHOMA

Society News.—Drs. Leroy Long and Lewis J. Moorman, both of Oklahoma City, were among speakers at a meeting of the Southern Oklahoma Medical Association, Norman, September 8, on "Acquired Arteriovenous Communication and Treatment" and "Recent Methods of Treatment in Advanced Pulmonary Tuberculosis," respectively. Group clinics were held at the Central Oklahoma State Hospital, Norman, on organic psychoses, convulsive states, functional psychoses and exogenous toxins.

PENNSYLVANIA

Society News.—H. Edmund Friesell, D.D.S., dean, University of Pittsburgh Dental School, addressed the Fayette County Medical Society, Uniontown, November 5, on "The Desirability of Better Cooperation Between Professions Engaged in Health Service."——Speakers at the meeting of the Washington County Medical Society, November 11, were Drs. Grover C. Weil on "Larval Therapy in the Treatment of Osteomyelitis and Acute Surgical Infections"; John Henry, "Treatment of Head Injuries by Hypertonic Solution," and William J. Fetter, Pittsburgh, "Cincophen Poisoning."

Philadelphia

Henry Leffmann Fellowship Awarded.—The Philadelphia College of Pharmacy and Science has awarded the Henry Leffmann fellowship for research in pharmaceutical chemistry to Amelia Mesa de Ponce, Pharm.D., Havana, Cuba. Dr. de Ponce, who is a member of the Cuban commission which translated the tenth revision of the U. S. Pharmacopeia into Spanish, will conduct research on the stabilization and standardization of ergot.

Society News.—A symposium on pyelitis was presented before the Philadelphia County Medical Society, November 11, by Drs. James L. Richards, who discussed pyelitis during pregnancy and the puerperium; William H. MacKinney, pyelitis in adults, and Howard Childs Carpenter, pyelitis in infancy and childhood.——Drs. Arthur Bruce Gill and Charles H. Frazier addressed the Philadelphia Academy of Surgery, November 2, on "Treatment of Fracture of the Neck of the Femur, Particularly the Question of Ununited Fractures" and "Use of Potassium Iodide in Hyperthyroidism," respectively.——Dr. Myron Metzenbaum, Cleveland, addressed the Philadelphia Laryngological Society, November 3, on "Dislocations of the Lower End of the Septal Cartilages."——Drs. Brooke M. Anspach and Jacob Hoffman presented a joint paper on "Diagnosis and Treatment of Endocrine Dysfunction Underlying Amenorrhea, Menorrhagia and Sterility"; Drs. Joseph C. Yaskin and Isaac Andrussier, a paper on "Syringomelia Complicating Pregnancy and Labor," and Drs. Lewis C. Scheffey, Thomas R. Morgan and Cheney M. Stimson, "Analysis of a Series of Cases of Ectopic Pregnancy," before the Obstetrical Society of Philadelphia, November 5.——Dr. Francis R. Packard will deliver the fifth Weir Mitchell Oration before the College of Physicians of Philadelphia, November 18, on "How Medicine in Philadelphia Was Influenced by London and Edinburgh in the Eighteenth Century."

SOUTH CAROLINA

Society News.—Drs. Austin T. Moore and John B. Setzler addressed the Columbia Medical Society, September 14, on treatment of fractures and the antipellagra campaign, respectively.——Among speakers at the meeting of the Third District Medical Society, Newberry, September 8, were Drs. Charles A. Mobley, Orangeburg, and Carroll J. Scurry, Greenwood, on basal and spinal anesthesia, respectively, and Floyd D. Rodgers, Columbia, treatment of carcinoma of the cervix.——The Fourth District Medical Society, at a meeting, September 8, at Anderson, heard addresses, among others, by Drs. Lawrence H. McCalla, Greenville, on "Practical Value of Friedman's Hormone Test for Pregnancy"; William T. Lander, Williamston, "Alkaline Treatment of Typhoid Fever," and Charles A. Mobley, Orangeburg, "Application of Surgical Drainage to Cesarean Section."

WASHINGTON

Society News.—Dr. William B. McCreery, among others, addressed the Pierce County Medical Society, Tacoma, September 8, on cesarean section.——Dr. Ora H. Cox, U. S. Public Health Service, read a paper on "Public Versus Private Medicine" before the Yakima County Medical Society, September 14.

Hospital News.—The Conway Hospital, Elma, which was closed in July, 1930, with the closing of mills and camps in the vicinity, was recently reopened.——Dr. Herbert G. Burden, medical superintendent of the Walla Walla Sanatorium, College Place, has resigned to enter private practice.——The Arlington General Hospital, Arlington, has closed after nineteen years of service.

WEST VIRGINIA

Society News.—Dr. Charles B. Wylie addressed the Monongalia County Medical Society, Morgantown, October 6, on "Paranasal Sinusitis as a Causative Factor in Ocular Troubles."——Dr. William S. Fulton, Wheeling, addressed the Marshall County Medical Society, Moundsville, October 13, on surgery in the Orient.——A symposium on tuberculosis was presented before the Raleigh County Medical Society, Beckley, October 15, by Drs. George F. Grisinger and Ulysses G. Cook, Beckley, and William P. Black, Charleston.——Drs. William H. Goodwin and Henry B. Mulholland, University, Va., addressed the Mercer County Medical Society, Bluefield, September 24, on "Endometriosis" and "Management of Diabetes," respectively.——Drs. William B. Porter, Richmond, Va., and Albert H. Hoge, Bluefield, addressed the Kanawha County Medical Society, Charleston, October 12, on "The Present Conception of Anemias" and "The Future of Organized Medicine," respec-

tively. Members of the West Virginia Alumni Association of the Medical College of Virginia were guests of the society at this meeting, which followed the annual alumni banquet. Dr. Hugh H. Trout, Roanoke, Va., addressed the society, November 3, on "Release of Pericardial Adhesions." —— Dr. Wells Teachnor, Columbus, Ohio, addressed the Ohio County Medical Society, Wheeling, October 16, on "Cancer of the Rectum and Colon."

GENERAL

New Journal of Thoracic Surgery.—The American Association for Thoracic Surgery at its annual meeting in July authorized the publication of an official journal, the *Journal of Thoracic Surgery*, the first issue of which appeared in October. It contains 112 pages of original articles, reviews and abstracts of current literature of this branch of surgery. Dr. Evarts A. Graham, St. Louis, is editor and Dr. Duff S. Allen, St. Louis, associate editor.

Lectures of Child Study Association.—Lectures and conferences to be given by the Child Study Association of America have been announced for the winter season. Dr. Clarence M. Hincks, director, National Committee for Mental Hygiene, New York, addressed the annual meeting, November 11, on "Mental Hygiene and Parent Education." An afternoon symposium on concepts of discipline will be held, November 24. An afternoon conference and exhibit will be held, December 1, on children's books. Dr. Frankwood E. Williams, New York, will deliver an evening lecture, January 5, on "Mental Hygiene of Parenthood." The meeting, January 19, will be featured by an afternoon symposium on "A Quarter Century of Sex Education in the United States."

Fund for Rural Medicine.—According to the *New England Journal of Medicine*, a fund for rural medicine has been established by Mr. William Bingham 2d, Bethel, Maine. Its immediate object is to give aid to the development of medical practice in the state of Maine. Incorporation will be sought for the project under the title of the Bingham Fund Associates for the Advancement of Rural Medicine. Mr. Bingham has appointed as associates Drs. John G. Gehring, Bethel; George Bourne Farnsworth, Cleveland, and Joseph H. Pratt, Boston. It was stated that a grant of $50,000 had been given by the new fund to Tufts Medical School, Boston, for the equipment and maintenance of the roentgen department and the observation ward at the New England Medical Center.

Southern Medical Association Meeting.—The twenty-fifth annual meeting of the Southern Medical Association will be held, November 18-20, in New Orleans, with Dr. Felix J. Underwood, Jackson, Miss., as president. At a general session Wednesday evening, November 18, Dr. Underwood will present his presidential address on "Public Health in the Prevention of State Medicine" and Major Gen. Robert U. Patterson, surgeon general of the U. S. Army, will speak on "The Earliest American Casualties in the World War." Among many speakers on the scientific program are Drs. Edward H. Cary, Dallas, on "Glaucoma: Its Importance and Contributive Causes"; Charles Wardell Stiles, Washington, D. C., "Prevalence of Hookworm Disease in Certain Parts of the South with a Proposition of a New Plan of Attack"; Carl C. Aven, Atlanta, "Birth Control and the Medical Profession"; Charles Jeff Miller, New Orleans, "Gynecologic Problems of the Colored Woman"; John L. Kantor, New York, "Observations on the Unstable Colon"; Bronson Crothers, Boston, "Pediatrician's Relation to Psychiatry and to Education"; Dean Lewis, Baltimore, "Surgery of the Stomach"; William Gerry Morgan, Washington, D. C., "End-Results of Treatment for Peptic Ulcer"; James S. McLester, Birmingham, Ala., "Instability of the Autonomic Nervous System as a Cause of Digestive Disorders"; Temple S. Fay, Philadelphia, "Recent Neurological Advances and Their Importance in the Field of Medicine"; Eugene P. Pendergrass, Philadelphia, "Roentgen Diagnosis of Diseases of the Neck and Upper Respiratory Tract"; Vilray P. Blair, St. Louis, "Early and Late Care of Mutilating Burns"; Emil Novak, Baltimore, "Etiology and Treatment of Functional Uterine Bleeding"; Edward L. Keyes, New York, "Treatment of Prostatic Bars and Sclerosis"; Rafael Silva, Mexico City, "Onchocercosis," and Harvey J. Howard, St. Louis, "Offensive and Defensive Mechanism in Acute Infections of a Mucous Membrane." The section on medicine will hold a symposium on heart disease and the sections on gynecology and obstetrics a joint round table discussion on obstetric practice. Meeting concurrently will be the American Society of Tropical Medicine, the National Malaria Committee, the Woman's Auxiliary to the Southern Medical Association, and the Women Physicians of the Southern Medical Association.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 24, 1931.

Failure of the Bendien Method of Diagnosing Cancer by Blood Examination

In a previous letter, the visit to London of a Dutch physician, Dr. Bendien, who claimed that he had discovered a method of diagnosing cancer by blood examination, was described. The method was at once tried in several laboratories. Dr. Alfred Piney, research pathologist of the Cancer Hospital, reported that the technic was difficult and complicated but that "we are already of opinion that Bendien's work is of considerable value." The investigation committee of the British Empire Cancer Campaign was at first so impressed that it promised Dr. Bendien financial support for his researches. But after the preliminary results had been found encouraging, "subsequent inquiries failed to justify the early promise." The committee therefore came to the conclusion that "the Bendien method of diagnosis for malignant disease cannot at the present time be accepted as reliable." At the London Hospital the pathologists Dr. F. Campbell Smith and Dr. J. R. Marrack found that the absorption curves of solutions obtained from the serums of patients with cancer and with various other diseases changed on standing from the curve given by Bendien for tuberculosis to that given for cancer. This is fatal to the spectrometric part of Bendien's test. Thus, after being acclaimed in the daily press as a discovery of the first importance, Dr. Bendien's test has failed. It is noteworthy that his work received no attention from Dutch scientists, although he wrote a book on the subject. Similarly, Sphalinger has been periodically boomed in the English lay press, though never recognized in his native Switzerland. Bendien seems certainly a genuine worker but carried too far by his enthusiasm.

The Radium Treatment of Cancer

GUARDED REPORT OF THE RADIUM COMMISSION

The second annual reports of the National Radium Trust and the Radium Commission have been published. The remainder of the 10 Gm. of radium purchased from the Union minière has been delivered. The commission has systematically developed its plan of concentrating radium at certain hospital centers, each of which has been nominated by the medical faculty of the local university. A rental of 2 per cent per annum of the capital value of the radium and containers on loan has been charged to cover the overhead expenses of the commission. Visits to the centers revealed a fine spirit of cooperation. The total amount of radium now ordered or approved to be ordered by the trust amounts to 24.9 Gm. The results obtained with the 4 Gm. bomb at the Westminster Hospital over a period of more than a year confirmed the experience of foreign workers that this form of radium therapy under present conditions of knowledge cannot be recommended for the treatment of cancer. The future of the bomb is being considered because in some centers abroad, notably Paris, New York and Stockholm, more favorable views prevail about the value of bomb treatment in certain regions of the body. In its first report the commission emphasized the importance of caution in estimating the value of radium in the treatment of malignant disease. Its present opinion is one of "hopeful expectancy." It realizes the excellent results that radium often achieves in malignant disease of certain regions, particularly the uterus, breast, mouth and skin. Moreover, even when cure cannot be expected, the alleviation makes the treatment well worth while. On the other hand, cancer of other organs has not given such happy results and the commission's note of caution was intended

to emphasize the dangers of generalization from success in a few areas of the body to success in every part. It is held that the great need at present is reliable information as to the value of radium in the hands of those who have the necessary knowledge. Further experience is necessary for the solution of this problem. The commission has already indicated a period of five years at least from the inception of the national scheme as necessary for any confident verdict.

GRADUATE EDUCATION IN RADIOTHERAPY

Two graduate courses in radiotherapy have been conducted in London—at Mount Vernon Hospital, which as a research school is receiving support from the Medical Research Council, and at the Radium Institute. Though successful, the warning is given that attendance at these courses, which are necessarily of short duration, cannot give the surgeon or even the surgeon radiologist sufficient knowledge and experience to practice radium therapy efficiently without the advice and assistance of a specialist radium officer.

NATIONAL RADON

The Radium Institute has undertaken to produce national radon from radium lent for this purpose by the commission for the benefit of such national centers and other institutions as are prepared to observe certain conditions with regard to its use. The radon will be supplied at the rate of 25 cents per millicurie for the use of nonpaying patients under the following conditions: (1) Application must come from an institution and not from an individual; (2) the institution must show that its staff is sufficiently experienced in the use of radon; (3) the staff must keep records of cases, including follow up, on the radium national forms, and send a summary of the results each year.

RADIUM RESEARCH

The commission has allocated 1 Gm. of radium element to the Medical Research Council and 0.18 Gm. to the National Physical Laboratory. The policy of such allocations to large corporate bodies in touch with persons especially qualified to conduct the kind of research work involved offers many advantages. An encouraging sign of the activity of research is that within a few months of completing arrangements with the Medical Research Council, 95 per cent of the gram had been allocated to research groups.

RADIUM OFFICERS AND THEIR RISKS

In a few cases, insufficient care has been taken of the lent radium and small quantities have been lost. Against this regrettable result, suitable action has been taken. But a far more serious consequence, in one or two instances, has been injury of the person charged with the duty of handling radium. Keenness in the work may lead to neglect of precautions, and the person may not be conscious of the injury to health until it is established. Even when periodic blood tests have been made, they have not been adjudicated by those competent to judge their significance. It is recommended that periodic blood counts should be submitted to a physician in medical charge of the radium staff. Radium officers require exceptional periods of rest. In order to become one, an otherwise qualified candidate should be trained at a recognized center, under skilled radiologists, for not less than twelve months.

"Colonies" for Mental Defectives

In January, 1930, the board of control (of lunacy administration), with the approval of the minister of health, appointed a committee to report on the essential structural requirements of a complete colony for mental defectives of all types, and on the extent to which the cost could be reduced by adoption of semipermanent or temporary buildings or of other new methods of construction. The report has just been published. Although not required to deal with questions of policy, the inquiry inevitably involved consideration of the present-day method of housing defectives in colonies, as compared with the older one of placing them in large barrack-like structures. The report is strongly in favor of the colony system and states that a complete colony should contain all the structures necessary for the housing, training and recreation of defectives of all grades and ages, and the arrangements should be designed with reference to the fact that the great majority of the colonists will reside there for many years and some for their lives.

PARIS

(From Our Regular Correspondent)

Oct. 7, 1931.

International Dental Congress

The seventh International Dental Congress was held recently in Paris at the Grand Palais, under the chairmanship of Dr. Villain, and with the minister of public health in attendance. An immense exhibit of dental apparatus and dental products, displayed by more than 300 French and foreign exhibitors, was an interesting feature. Thirty-three countries were officially represented. The delegates from the United States were Messieurs Olliver, Emerson, Percy Howe, Leland Legro, Puterbaught, Turner and others. More than 400 papers were presented, a large proportion of which emanated from the foreign contingents. Mr. Yamabaki and Mr. Hanazawa, Japanese, offered some remarkable histologic studies on dental tissues. The speakers included Mr. Leland Legro, Mr. Ottolangi of Turin, Mr. James Warwick of London, Mr. Lartschneider of Linz, Mr. Karlström of Berlin, Mr. Mizuami Kekuo of Japan, Mr. Cieszinski of Lemberg, Mr. Balenosa of Colombo, Mr. Baya of Lisbon, Mr. Douglas Radfort of Edinburgh, Mr. Guilmour of Liverpool, Mr. Metral of Geneva, Mr. Chiwaki of Tokyo, Mr. Dubeau of Montreal, Mr. Clausen of Beirut, Mr. Puterbaught of Chicago, Mr. Salas of Chile, Mr. Jaccard of Geneva and Mr. Fehr of Berlin. A long discussion developed concerning the material to be used in bridges. Legro of Philadelphia recommended porcelain teeth set in a peg of iridescent platinum. Gonon and Lakermance of Paris advocated the use of wires enclosed in the porcelain and baked in the paste according to the same principles as for the manufacture of reinforced concrete in the building industry. Another discussion arose over the question of alveolar pyorrhea, and again over that of operative anesthesia, which brought into comparison regional anesthesia at the points of the emerging nerves and trunk anesthesia at the level of the nerve ganglions, and still another on maxillofacial prosthesis. An article was read by Dunning of New York on inflammation of the inferior maxillary nerve and its treatment.

The Congress of Reparative and Cosmetic Surgery

The second Congrès de la société française de chirurgie esthétique met, October 2, in Paris, under the chairmanship of Dr. Dartigues. Although the scope of the congress was somewhat limited, the attendance was large. It was hard to believe that so many surgeons in France had taken up this specialty. There were also many foreigners present: Jauregi of Buenos Aires, Coelst of Brussels, Marchal of Antwerp, Rueda Vargas of Colombia, Slocker, Luke and Alvarez of Madrid, Manna of Rome, San Venaro Roselli of Milan, Amersbach and Hardt of Germany, Dos Santos, Madureira of Lisbon, Precechtel of Prague, Jiano of Bucharest, Corachan of Barcelona, and Montavé of Havana. There were also several women physicians. Some fifty papers were presented. Several speakers explained new methods of rhinoplasty and plastic reconstruction of the nose; others described the mode of taking and the fixation of various grafts; others reparations on the cornea and the adnexa of the eye; several spoke on plastic operations on the breasts, and on plastic correction of the effects of facial paralysis. There

were also interesting communications on kindred subjects; for example, one by Auguste Lumière of Lyons on senility, and another by Dr. Bérillon on obsessions associated with deformities.

The International Congress of Psychotherapy

The third International Congress of Psychotherapy, Hypnology and Applied Psychology held its sessions in Paris, September 28 to October 4, under the chairmanship of Dr. Bérillon. The first congress was held in August, 1889, under the chairmanship of Dumontpallier; the second in August, 1900, under the chairmanship of Raymond. Although the program was limited in its scope, there were numerous communications presented on the official topics, to mention the general indications of psychotherapy considered as an independent specialty; psychotherapeutic methods and psychologic treatment; the rôle of hypnotism, hypnoid states and hypotaxia in psychotherapy; the relation between physical agents and psychotherapy; psychotherapy in management of psychosexual disorders; the applications of psychotherapy to normal pedagogy and mental orthopedics; psychotherapy in isolation treatment and in treatment at thermal springs; the applications of psychotherapy in surgical interventions; the applications of psychotherapy in the dental art; psychotherapy from the social point of view; psychotherapy in veterinary practice; psychotherapy in the education of the judgment and the conception of good judgment, and the psychotherapy of timidity. The congress was attended by several foreign physicians, chiefly from Central America, Peru, Salvador and England.

The International Conference on Mental Prophylaxis

An international conference on mental prophylaxis was held recently at the Hôpital Henri-Rousselle, under the chairmanship of Justin Godart, senator and formerly minister of health, assisted by Dr. Toulouse and Dr. Génil-Perrin, president and secretary, respectively, of the Ligue nationale d'hygiène mentale. At this conference, which was attended by delegates from the organizations on mental hygiene in many countries of Europe, Dr. Toulouse brought about the adoption of a series of resolutions establishing the essential principles of the organization and of mental prophylaxis, of which this is the text: "The conference demands that hygiene and mental prophylaxis be studied by all psychiatric organizations and organizations of mental hygiene in their scientific bases, with the aid of objective methods, particularly biologic methods. Mental prophylaxis should be organized intensively after the manner of the crusade against the social evils tuberculosis, syphilis and cancer; it should consider all the forms of psychopathy and especially infantile psychopathy, including the prophylaxis of crime, and should institute researches in the field of sexology with a view to diminishing the number of persons presenting neurobiologic defects. The 'open' psychiatric hospital will be the essential organization for psychiatric aid, and the hospital for the insane transformed into an 'open' psychiatric hospital, with a 'closed' section as an annex. The regulations concerning the internation, the retention and the discharge of mental patients should be made as uniform as possible in the different countries, the physician assuming the predominant rôle, and a stated length of internment being reserved for dangerous patients. All the local societies of mental hygiene will be combined into national organizations forming an international federation, and the respective governments will be urged to bring about the creation of a section on mental prophylaxis within the League of Nations."

Decision of Court with Regard to the Right of Scientific Criticism

The tribunal de Lille recently rendered an interesting decision in a lawsuit brought by a physician of the city against Dr. David, to recover 200,000 francs ($8,000) damages for having hurt his practice by declaring, in a journal of the region, that a certain treatment for tuberculosis recommended by the plaintiff possessed no value. The plaintiff administered to his patients pills of a complex composition containing, among other ingredients, collargol, nucleic acid and sodium cinnamate, and prescribed in addition a few treatments of diathermy. He requested that the Comité départemental de préservation de la tuberculose du département du Nord submit his form of medication to an investigating committee, which request was granted. The committee appointed proceeded with experiments on nineteen tuberculous patients of a dispensary, and the observations were made by the committee with great care. Its conclusions were entirely unfavorable. The pills brought about no improvement, and the diathermic treatments tired the patients greatly, and in some instances even induced hemoptysis. The new method had been widely advertised in the daily press of the region. Dr. David then published, in the *Journal des sciences médicales de Lille*, an article in which he advised frankly against carrying out these experiments, all of which proved unfavorable. The court refused to allow any damages, holding that Dr. David had merely used his right of scientific criticism in a spirit of honest impartiality. This decision justifies the hope that the necessary campaign against charlatans and inventors of secret remedies for tuberculosis will now be carried on with vigor. Unfortunately, another decision, rendered previously by the tribunal de Meaux, was of an opposite character, since it imposed a sentence on Dr. Nast, who, by means of posters, had made it his duty to warn the people of his section against the maneuvers of a charlatan who pretended to cure tuberculosis in his dispensary by means of pills consisting essentially of paper and the yolks of eggs. This decision had aroused loud protests from the medical profession. The decision of the tribunal de Lille is more consoling; but it applies only to criticisms published in a medical journal and not given directly to the public. However, Dr. Saenz of the Pasteur Institute recently published in the daily press an article in which he describes the experiments carried out in the Pasteur Institute to test the prophylactic and curative value attributed to the Friedmann vaccine prepared from tubercle bacilli derived from turtles, and declares that it has no value either for animals or for human beings. This publication warns frankly the public against this false remedy, which is employed in some dispensaries. No protests as yet have been made by these dispensaries. They think doubtless, and perhaps rightly, that the public paid no attention to the article in question.

BERLIN

(From Our Regular Correspondent)

Oct. 5, 1931.

The Decline of the Birth Rate

A subject that at present is in the forefront of scientific discussions is the influence of the reduced birth rate on the population. In recent years, the decline in the birth rate has been so marked that it has awakened in many circles fear as to the future of the German people. Following numerous publications by other authors, a book by E. Kahn has appeared, "Der internationale Geburtenstreik," which presents considerable interest, although it requires a critical evaluation, such as Prinzing, an authority on medical statistics, has given it. Kahn draws conclusions that differ from those of other authors, although his conclusions are based on the same material as theirs. Whereas the statistics usually consider the number of births in relation to the number of women of child-bearing age, Kahn takes account of the number of births in relation to the number of marriages for the year. The children born later from these unions are not considered. With an increasing number of marriages this fertility figure will be too small,

and with a declining number of marriages it will be too high. Kahn figures out therefore a much more rapid and a greater decline in the birth rate for Germany than do the other authors. He assumes also that the decline of the birth rate in all Germany will equal eventually the present much greater decline in the large cities and among the Jews. Kahn considers also the vital statistics in other European countries. In all the countries of northern and western Europe, with the single exception of the Netherlands, a marked decline in the birth rate is observable. The high mortality in France is doubtless due solely to a changed distribution of the age groups, a natural result of the low birth rate that has existed for years. However, it should be borne in mind also that not until recent years has there been an energetic combating of tuberculosis in France. Kahn thinks that there is evidence of a beginning limitation of births also among the Slavic nations and that the natural increase of population among them appears to be approaching the end. Others, however, earnestly oppose this view and call attention to the invasion of eastern Germany by Slavic elements. It is contended also that the mortality of the Slavs, who are now adopting German methods of combating social diseases and child mortality and are introducing German hygienic methods, might be greatly reduced. It will be many decades before the great increase of population in eastern Europe will cease, if it ever does.

Accompanying the decline in the birth rate is a change in the distribution of the age groups of the population. As a result of the high birth rate of previous years, Germany has today a much larger number of persons capable of pursuing a gainful occupation than before the war. In 1910 there were from 35 to 36 million such persons in Germany (aged from 15 to 65 years), whereas now there are 45 million. That explains in part the large number of unemployed persons, since the demand for labor, in view of the economic conditions and the replacement of much manual labor by machines, has not increased. Not until 1970 will the problem arise of a decrease in the number of persons of wage-earning age (15 to 65). Both authors are agreed that the burden of pensions and old age benefits will increase from year to year. In 1925, the number of persons more than 70 years old was 3.17 per cent. It is estimated that there will be 5.64 per cent above that age in 1950 and 7.7 per cent in 1970. Kahn fears that the "one or no child system" that prevails at present in Berlin will be extended to the smaller cities and to the rural districts. He does not count on much improvement in demographic conditions through the introduction of government measures. Families with many children may obtain thereby some economic relief, but the actual number of children will not be increased by such measures. A change for the better cannot be expected to begin in the large cities. If it comes at all it will have to start in the small cities or the rural districts. No improvement can be hoped for until political conditions have become more settled. That the joy in a beautiful family life with a number of sturdy and healthy children has not entirely disappeared from the hearts of the German people is still shown by the good-sized families found in places that are far removed from the influences of metropolitan life. The good eugenic effects of such sound and healthy German families will become manifest again after the lapse of a few decades.

Roentgen Cinematography

Dr. Gottheiner and Dr. Kurt Jacobsohn of Berlin have succeeded, with the aid of the Deutsche Forschungsgesellschaft, in devising a roentgen cinematographic method by which the movements of the internal organs can be recorded on a film, which will make it possible to avoid many misleading features of the ordinary roentgenogram. A special cinematographic camera is employed, which is equipped with an extremely strong objective. This camera serves to photograph the shadows thrown on a special screen by the roentgen rays. Also the film material is characterized by an extremely high sensitiveness never before attained. It has been found possible to record the various movements of the diaphragm during respiration, coughing and speaking. In collaboration with the phonetic institute of the Charité Hospital, these films are to be used in creating a system of instruction for singers and actors. The films show distinctly the movements of the organs of the upper respiratory tracts. The pictures are so clear that an expert can reconstruct all the spoken syllables, which opens up new possibilities for the didactics of speaking and particularly for the education of deafmutes.

The Ventilation of Living Rooms

During the past ten years, the new type of apartments have been distinguished by their simplicity and their practicality. It is important, from the standpoint of the physician, that, along with many advantages—in the methods of heating, the hygienic cooking arrangements, and the like—there are associated disadvantages that arise from the style of construction and an exaggerated effort to save space. Owing to the increased cost of building material and to high wages, an endeavor is made to cut down expense by reducing the height of the ceilings and the area of floor space. The walls are not as sound proof as formerly, which results in damage to the nervous system of the occupants of these new-styled apartments. In rooms with reduced cubic contents, the question of ventilation takes on added importance. Recent investigations by W. Liese of Berlin show that the increase of air pressure before screens and draperies, when currents of air strike them, is less in the case of screens made of rods or wires than with those having punched-out holes, even assuming that the porosity is the same. The air pressure produced by filter cloth and drapery materials, except netting and voile, is so great that the effects of window ventilation are almost nil if shades and draperies are drawn.

VIENNA

(From Our Regular Correspondent)

Oct. 8, 1931.

Abortion in Austrian Hospitals

The Austrian public health service instituted an inquiry (beginning with the year 1929) into the problem of abortion, which, together with the decline in the birth rate, has for years occupied the forefront of demographic interest. It is of course impossible to obtain reliable information in regard to cases of abortion that take place outside the hospitals. Hence, the inquiry was confined to cases that occur chiefly or entirely in hospitals. About 9,000 cases are involved. This number is of course not identical with the actual number of abortions in Austria. The purpose of the inquiry was to show the dangers associated with miscarriages as revealed by the number of deaths and disorders, and likewise to gain an insight into social conditions. To the various hospitals record cards were distributed, which were filled out so as to give certain data in regard to the patient: the time of the last menses, the time of the abortion, the number of previous births or miscarriages, the number of children still living, and the results of the abortion. The cards for the year 1929 were worked over by the statistical bureau of the ministry of health. The largest number of cases of abortion occurred among unmarried women of the age groups 21 to 25, and among married women of the age groups 26 to 30. The abortion occurred in 80 per cent of the cases in the second and third months of pregnancy, no difference being observable between married and unmarried mothers. In 9.6 per cent of the abortions, pathologic sequels developed; in Vienna alone, the proportion was more favorable: 5.9 per cent. The case

mortality was 0.75 per cent (Vienna, 0.60 per cent), another proof that the care in the city hospitals gives better results. However, inquiries in the gynecologic departments revealed that the figure 9.6 for the percentage of patients suffering from after-effects of abortion is much too small. From the personal histories of patients in any hospital of the kind, one can find in much more than 10 per cent the anamnesis that the present disorders are traceable to a previous abortion. Many cases of chronic endometritis and parametritis remain long latent. Also menstrual and other disturbances must frequently be ascribed to a former abortion. In the 9,000 cases, death ensued in only 0.75 per cent, whereas in the combined statistics of hospitals among the causes of death, as affecting the patients in general, abortion is put down at 2 per cent. According to general statistics, as well as from the study of the 9,000 cases, it is revealed that especially the first pregnancy results in abortion (about 25 per cent). It is not so rare for women to have from ten to twelve abortions; indeed, there were in this series of 9,000 cases two women in whom fifteen miscarriages and one woman in whom sixteen miscarriages were observed. As to whether sterility is a frequent result of injuries due to abortion, only more extensive statistics can decide; but there are many indications that such is the case. It must be emphasized that these statistics, published for the first time, can lay no claim to completeness. They include not more than 10 per cent of the abortions in Austria and are to be taken as a first attempt toward the solution of this problem.

Surgical Treatment of Bronchiectasis

Addressing the Vienna Medicinisches Seminar, Professor Dr. Walzel discussed the modern surgical treatment of bronchiectasis, which in his opinion has not yet fully solved the problem. Frequently the disease takes on the symptoms of a lung abscess, or, in the beginning, it may be confused with chronic bronchitis and therefore recognized too late. The most important symptoms are a large amount of fetid sputum and chronic illness; the wall of a cavity may be ruptured, permitting the contents to enter the adjacent tissues (mediastinum), which leads to a fatal issue. A radiologic examination (with the aid of iodized oil) reveals the position and the size of the process. Conservative therapy by means of pneumothorax and paralysis of the diaphragm has often been tried but does not give satisfactory results; nor has resection of several ribs proved effective. The introduction of large plugs of paraffin over the bronchiectatic area has given better results. Favorable results are secured by means of pneumotomy: the opening of good-sized bronchiectatic sacs as in pulmonary abscess. This operation is sometimes preceded by the introduction of a paraffin plug, or the ligation of the pulmonary artery supplying the left lower lobe is carried out. According to Professor Sauerbruch, in the event of isolated involvement of certain lobes the best procedure is the extirpation or partial obliteration of those parts. Professor Walzel recently effected a recovery in one case by encircling the patient's left lower lobe with a rubber drain, thus bringing about necrosis and ejection. After such interventions there remains in many cases a bronchial fistula, which can be closed later by a plastic operation. Dr. Sauerbruch, who has had the widest experience in this field, recently reported eighteen cases with only three deaths. The remaining fifteen patients were cured. Patients will rarely consent to such a radical intervention as extirpation of diseased portions of the lungs. The surgeons are therefore still confronted with unsolved problems of operative technic, so far as the treatment of bronchiectasis is concerned.

Gumma of the Bundle of His

At a recent session of the Innsbrucker Wissenschaftliche Aerztegesellschaft, Dr. Kux demonstrated an anatomicopathologic preparation of a 51 year old woman who had suffered from heart disease for years and who showed an electrocardiographic dissociation of the auriculoventricular movement: auricular rate, 36; ventricular rate, 90. She presented also the Adams-Stokes syndrome and a three plus Wassermann reaction. The patient died during an Adams-Stokes attack, such as occurred almost every hour for several days. The necropsy revealed a bilateral cardiac hypertrophy (more marked at the right), gummatous endocarditis of the tricuspid valve, a gummatofibrous myocarditis particularly of the right half of the heart, and a gumma that had developed from the conus arteriosus. The gummas were the size of a bean and located in the right atrial septum and the right ventricular septum, in the cusps of the tricuspid valve (especially in the septal cusp), in the conus arteriosus, and in the media of the pulmonary artery. In addition, there was a syphilitic mesaortitis, combined with atherosclerosis. By means of serial sections of the ventricular septum, histologic evidence of the complete interruption by gummas of the main trunk of the conduction system could be adduced, which explained the automatism of the ventricular function.

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct. 15, 1931.

Studies on Normal Thyroid Gland in Adults of Rio de Janeiro

Drs. G. Villela and A. Penna Azevedo, from the Instituto Oswaldo Cruz, recently wrote an article on normal thyroid glands of adults of Rio de Janeiro. The material for study was obtained at necropsies on twenty-two persons who during life never presented clinical symptoms related to the thyroid gland and whose death was caused by infectious diseases. The experiments were performed thus: The entire gland was removed and weighed. A 5 Gm. portion of the gland was kept for calculation of the iodine and water contents of the entire gland. With the remaining portion of the gland, histologic studies were made. The gland proved to be normal under both macroscopic and microscopic examinations. Paraffin sections from every specimen, stained by hematoxylin-eosin, were examined after careful macroscopic description. Helly's fluid was the fixative used. The microscopic examination of the gland showed the presence of ovoid or round follicles of different sizes, within normal limits. The thyroid lobes were slightly delimited by fibrous septums. The glands were made up of groups of follicles containing an eosinophilic colloid matter. They presented a homogeneous aspect, and sometimes vacuoles were observed in the interior of the gland. The epithelium of the glands, which is formed of cubic cells with small and vesicular nuclei, was detached from certain areas of the gland, and the cells were mixed with the colloid substance. There was no thickening of the connective tissues or congestion of the walls of the blood vessels. The authors present, in tabular form, the age, sex, height and weight of the persons before death, as well as the cause of death in the given case, and also the time that elapsed between death and necropsy. They found that the weight of the glands varies from 8.1 to 42.66 Gm., with a general average of 18.91 Gm. and an individual average of 20.99 Gm. in men and 15.53 Gm. in women. The authors' results relative to the difference in weight of the thyroid gland of men as compared to that of women agree with Gastaldi's results in his studies of the thyroid gland in different parts of Italy. However, the general average of the weight of the thyroid gland, in the studies made by Villela and Azevedo, is lower than that given by other authors (20-25 Gm., Cowdry; 20-27 Gm., Marine and Lenhart; 25-30 Gm., Testut; 27 Gm., Hersfeld and Klinger; 25 Gm., Guiart; 26-30 Gm., Zunz, Closs and Wülfert). The water content of the thyroid gland varied from 70.2 to 80.8 per cent, with an average

of 74.8 per cent. The variations were not so great as those given by other authors (Zunz, Vitry and Giraud, Claude and Blanchetière). The iodine content was determined by Kendall's method, modified by Kelly and Husband. The total iodine content was calculated from the water content. The iodine content was from 0.3 to 9 mg. per gram of dried thyroid, with an average of 1.99 mg. per gram of dried thyroid substance; that is, from 1.2 to 39 mg., with an average of 8.37 mg. for the total gland. The figures of dried thyroid glands of men and of women gave averages of 2.06 and 1.88 mg., respectively. American authors (Wells, Marine and Lenhart) gave averages for men and for women of from 2.1 to 2.17 mg. of iodine per gram of dried substance. Some European authors gave averages from 0.63 to 2.8 mg. for 1 Gm. of the dried substance. There is no relationship between the age of the individual and the content of iodine and water of the thyroid gland. In short, it was established that the average weight of normal thyroid of persons of Rio de Janeiro is 18.91 Gm., with a water content of 74.8 per cent and an iodine content of 1.99 mg. for 1 Gm. of dried thyroid; that is, 8.37 mg. for the entire gland.

Experiments with Virus of Typhus Fever

Dr. J. L. Monteiro, from the Instituto Butantan of São Paulo, recently published the results of his work on problems dealing with the relationship between the micro-organism of the Rickettsia group and those organisms which are the etiologic agents of the varieties of the exanthematic typhus fever of São Paulo. A previous letter told that the author could prove the presence of micro-organisms of the Rickettsia group in Descemet's membrane, after the inoculation of the virus of exanthematic typhus fever of São Paulo, by the ocular route, into guinea-pigs. Recently the author also proved the presence of the same organism in the endothelial cells of the peritoneal wall of guinea-pigs, previously injected by the intraperitoneal route with the same virus. The author regards exanthematic typhus of São Paulo as a native disease which has its own individuality although belonging to the group of typhus fever. He proposes the name of "Rickettsia brasiliensia, n. sp.," to distinguish the causative micro-organism of this variety of typhus fever.

Marriages

CLARK LEE SHIPLEY, Paris, Ill., to Miss Veronica McCormick of Ambia, Ind., in Terre Haute, July 15.

BEDFORD FORREST MCANULTY, Bolivar, Tenn., to Miss Eva May Montgomery in Memphis, September 6.

EARL E. KLEINSCHMIDT to DR. GLADYS J. KLEINHEKSEL, both of Ann Arbor, Mich., September 12.

SEBA LORRAINE WHITEHEAD, Asheville, N. C., to Miss Charlotte Eleanor Barber, September 30.

GEORGE F. BICKNELL, East Chicago, Ind., to Miss Emily Klawitter of Calumet City, October 10.

HAROLD BELLIN, Albany, N. Y., to Miss Mildred Grosberg of Saratoga Springs, November 1.

HAROLD T. GUSTAFSON, Minneapolis, to Mrs. Mildred Lindesay of Blue Earth, in September.

SIDNEY PECK COHEN, New York, to Miss Sally Kreenwich of Jersey City, N. J., June 14.

OSCAR A. SANDER, Milwaukee, to Miss Meriam Wright of Delavan in Madison, recently.

ISRAEL EZRA TURNER, Durham, N. C., to Miss Minnie Pearson, September 2.

GRAYDON D. UNDERWOOD, Cleveland, to Miss Meriel Latham, September 6.

L. A. GATES, Bridger, Mont., to Miss Izola M. Albrecht of Minneapolis, recently.

HERMAN H. MAI, Chicago, to Mrs. Bertha Eckert, September 18.

Deaths

Joseph Daniel Becton, Sr. ✠ Greenville, Texas; University of Nashville (Tenn.) Medical Department, 1890; member of the House of Delegates of the American Medical Association, 1911-1913 and 1924; member of the state board of medical examiners and the American College of Surgeons; past president of the State Medical Association of Texas, Hunt County Medical Society and the Medical Association of the Southwest; formerly professor of pathologic surgery, Baylor University, Dallas; surgeon in chief and owner of a hospital bearing his name; aged 65; died, October 14, of nephrolithiasis and empyema.

Margaret F. Butler ✠ Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1894; professor of laryngology, rhinology and otology at her alma mater; member of the American Academy of Ophthalmology and Oto-Laryngology and the American College of Surgeons; rhinologist and oto-laryngologist to the Woman's Hospital of Philadelphia; aged 70; died, October 16, of cerebral hemorrhage, while operating on a patient.

James Conley Merriman Floyd ✠ Steubenville, Ohio; Long Island College Hospital, Brooklyn, 1875; past president of the Ohio State Medical Association and the Jefferson County Medical Society; at one time member of the school board; aged 79; formerly on the staff of the Ohio Valley Hospital, where he died, October 17.

Henry Vining Ogden, Milwaukee; McGill University Faculty of Medicine, Montreal, Que., Canada, 1882; member of the State Medical Society of Wisconsin; formerly on the staffs of the Columbia Hospital, Milwaukee Children's Hospital and the Milwaukee Hospital; aged 74; died, October 10, of chronic lethargic encephalitis.

William Leland Stowell, Bronxville, N. Y.; Medical Department of the University of the City of New York, 1881; at one time instructor in diseases of children at his alma mater; formerly on the staff of the New York City Children's Hospital, New York; aged 71; died, September 30, of cerebral hemorrhage.

Martha Mitchell Bacon, Kansas City, Mo.; College of Physicians and Surgeons, Medical Department Kansas City University, 1897; member of the Associated Anesthetists of the United States and Canada; aged 68; died, October 21, of bronchopneumonia, chronic bronchitis and arteriosclerosis.

Ambrose Elisha Potter, Springfield, Mo.; St. Louis College of Physicians and Surgeons, 1911; member of the Missouri State Medical Association; served during the World War; aged 45; died, September 1, in the Springfield Hospital, of internal hemorrhage, due to an automobile accident.

Benjamin C. Brett, Green Bay, Wis.; Dartmouth Medical School, Hanover, N. H., 1860; member and past president of the State Medical Society of Wisconsin; Civil War veteran; for more than twenty years health officer of Green Bay; aged 99; died, October 10, of senility.

Thomas Dartwell Taggart ✠ Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1896; for twenty-five years connected with the Atlantic City Hospital; aged 61; died, September 23, in St. Louis, of septicemia, chronic myocarditis and hypertrophy of the prostate.

Charles Edward Banks ✠ Brookline, Mass.; Dartmouth Medical School, Hanover, N. H., 1878; for many years senior surgeon in the U. S. Public Health Service; aged 77; died, October 21, in Hartford, Conn., of coronary thrombosis and pulmonary edema.

Leroy Southmayd ✠ Great Falls, Mont.; University of Michigan Medical School, Ann Arbor, 1892; past president of the Medical Association of Montana; on the staff of the Columbus Hospital; aged 62; died, August 29, of cerebral hemorrhage.

Abraham M. Zebold, Shelby, Ohio; Starling Medical College, Columbus, 1884; on the staff of the Shelby Memorial Hospital; aged 77; died suddenly, October 1, at the home of his son in Garden City, L. I., New York, of heart disease.

Nicholas G. L. Shillito ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1895; member of the American College of Surgeons; served during the World War; aged 60; died, October 18, of intestinal carcinoma.

Joseph Patrick Kearney, Lowell, Mass.; Tufts College Medical School, Boston, 1908; member of the Massachusetts Medical Society; served during the World War; aged 52; died, September 25, of coronary thrombosis.

William Bartlett Gambrill, Ellicott City, Md.; University of Maryland School of Medicine, Baltimore, 1878; member of the Medical and Chirurgical Faculty of Maryland; aged 82; died, October 14, of heart disease.

Harriet M. Owens, Princeton, Ill.; Woman's Medical College of Pennsylvania, Philadelphia, 1892; aged 59; died, August 8, in the Seaside Hospital, Long Beach, Calif., of bronchial asthma and bronchopneumonia.

Coleman Ashton Newland ⊕ Springfield, Colo.; Barnes Medical College, St. Louis, 1899; president of the Prowess County Medical Society; aged 54; died, September 30, in Las Animas, of septic sore throat.

Jesse Dawson Skidmore, Memphis, Mo.; St. Louis Medical College, 1859; formerly county coroner and member of the state legislature; aged 94; died, September 22, of carcinoma of the mouth and larynx.

Thomas Whitelaw Sims, Eheart, Va.; University of Virginia Department of Medicine, Charlottesville, 1893; aged 63; died, September 18, in the Memorial Hospital, Richmond, of cerebral hemorrhage.

William Wilson Donaldson, Cleveland; Western Reserve University School of Medicine, Cleveland, 1915; member of the Ohio State Medical Association; aged 45; died, October 26, of heart disease.

Richard Franklin Shahan, Eddyville, Iowa; State University of Iowa College of Medicine, Iowa City, 1904; member of the Iowa State Medical Society; aged 52; hanged himself, September 30.

Ebert Caleb Collins ⊕ Philadelphia; Medical Department of the University of Southern California, Los Angeles, 1912; served during the World War; aged 49; died, October 14, of heart disease.

Ferdinand Phileas Canac-Marquis, San Francisco; Victoria University Medical Department, Coburg, Ont., Canada, 1886; aged 73; died, August 23, of angina pectoris and bronchiectasis.

Charles Seymour Langley, Seattle; L.R.C.P., Edinburgh, L.R.C.S., Edinburgh, and L.F.P.S., Glasgow, 1893; served during the World War; aged 63; died, June 9, of heart disease.

Montrose Walden Clare, San Diego, Calif.; Missouri Medical College, St. Louis, 1896; aged 59; died, August 28, of coronary thrombosis, rupture of the ventricle and arteriosclerosis.

Calvin Alfred Ames, Toronto, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1902; served during the World War; aged 51; died, July 6, of heart disease.

Arthur Guy Hunt, Washington, D. C.; Memphis (Tenn.) Hospital Medical College, 1904; served during the World War; aged 53; died, September 14, in the U. S. Naval Hospital.

Dudley Palmer Smagg, Stottsville, N. Y.; Bellevue Hospital Medical College, New York, 1888; aged 77; died, October 3, in the Hudson (N. Y.) City Hospital, of pneumonia.

Lewis Brownson Amsbry, Utica, N. Y.; Hahnemann Medical College of Philadelphia, 1898; Jefferson Medical College of Philadelphia, 1904; aged 60; died, September 19.

Gordon Augustus Beedle, Kansas City, Mo.; Kansas City Medical College, 1894; member of the Missouri State Medical Association; aged 61; died, October 22, of heart disease.

Thomas Nicholas Meriwether, Clarksville, Tenn.; Memphis Hospital Medical College, 1891; aged 61; died, October 2, in the Central State Hospital, Nashville, of myocarditis.

Salem Wales Goodale, Millbrae, Calif.; College of Physicians and Surgeons of San Francisco, 1901; aged 59; died, August 22, of cerebral hemorrhage and arteriosclerosis.

Jarvis Adams Whitten, Butler, Pa.; Jefferson Medical College of Philadelphia, 1893; aged 60; died, October 7, in the Presbyterian Hospital, Pittsburgh, of diabetic gangrene.

Edward F. Biewend ⊕ St. Louis; St. Louis College of Physicians and Surgeons, 1886; aged 77; died, October 20, of myocarditis, angina pectoris and tumor of the bladder.

John H. Ravenscroft ⊕ Albion, Ind.; Maryland Medical College, Baltimore, 1902; county health officer; aged 55; died, October 12, of intestinal hemorrhage due to ulcers.

Reinert Hetlesater, Garden Home, Ore.; Drake University Medical Department, Des Moines, 1889; aged 78; died, October 5, of angina pectoris and arteriosclerosis.

Wilbur Fiske Noyes, Boston; Hahnemann Medical College and Hospital, Chicago, 1892; aged 64; died suddenly, October 15, at his home in Cambridge, Mass.

Joseph W. T. Allen, Spartanburg, S. C.; Medical College of the State of South Carolina, Charleston, 1898; aged 56; died suddenly, October 6, of cerebral hemorrhage.

Thaddeus Paczkowski ⊕ Bloomfield, N. J.; Universität München Medizinische Fakultät, Munich, Germany, 1898; aged 62; died, October 15, as the result of a fall.

Frank Savage, Hatch, N. M.; University of Tennessee Medical Department, Nashville, 1905; aged 58; died, September 15, in El Paso, Texas, of heart disease.

Mark A. Wickware, Pearsall, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1901; county health officer; aged 64; died, in September.

Palmerston Cornick Campbell ⊕ Richmond, Calif.; Northwestern Medical College, St. Joseph, Mo., 1890; aged 63; was found dead, October 16, of angina pectoris.

Granville M. White, Morristown, N. J.; Medical Department of Columbia College, New York, 1884; aged 76; died, October 16, of carcinoma of the esophagus.

Lewis Theodore Brock, Klamath Falls, Ore.; University of Oregon Medical School, Portland, 1897; aged 67; died, June 18, in the Coffey Hospital, Portland.

Thomas Jefferson Townsend, Bowling Green, Ky.; Medical Department of the University of the City of New York, 1869; aged 85; died, September 18.

William Francis Doyle ⊕ Pottsville, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1896; aged 57; died, October 14, of heart disease.

Cyrus S. Siegfried ⊕ Buffalo; Jefferson Medical College of Philadelphia, 1891; aged 71; died, October 16, of cerebral hemorrhage and arteriosclerosis.

Charles M. Deibert, Toledo, Ohio; National Normal University College of Medicine, Lebanon, 1894; aged 63; died, October 4, of diabetes mellitus.

Barton Dozier, Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1876; aged 80; died, August 31, of pulmonary tuberculosis.

Laura Stitzer Chapin ⊕ Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1888; aged 76; died, October 15, of heart disease.

John H. Reeves, Coopertown, Tenn.; University of Tennessee Medical Department, Nashville, 1890; aged 70; died, October 5, of angina pectoris.

George Logie Dollar, Hornpayne, Ont., Canada; University of Toronto Faculty of Medicine, 1921; aged 44; died, September 15, of heart disease.

Thomas G. Greig ⊕ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1904; aged 49; died, October 12, of carcinoma of the liver.

Henry C. Bowers, Los Angeles; Kentucky School of Medicine, Louisville, 1894; aged 70; died, August 6, of a self inflicted bullet wound of the head.

George D. Hewitt, Carthage, N. Y.; Metropolitan Medical College, New York, 1863; Civil War veteran; aged 94; died, October 16, of senility.

John Warren Rockefeller, Gunnison, Colo.; Jefferson Medical College of Philadelphia, 1871; aged 81; died, October 4, of cardiorenal disease.

Cassius Milo Coldren, Jr. ⊕ Milford, Iowa; Rush Medical College, Chicago, 1919; aged 37; died, October 4, of phenobarbital poisoning.

William Penn Agnew, San Francisco; University of California Medical Department, 1875; aged 80; died, September 17, in Portland, Ore.

Henry S. Guthrie, Higginsport, Ohio; Starling Medical College, Columbus, 1881; aged 74; died, October 18, of cerebral hemorrhage.

Roderick E. McDonald, Palatka, Fla.; New York Homeopathic Medical College, 1880; aged 76; died, September 2, of senile debility.

David E. Stephan, Lorain, Ohio; Cincinnati College of Medicine and Surgery, 1897; aged 61; died, October 13, of heart disease.

William Grayson Harrison, Cushing, Okla.; University of Louisville (Ky.) School of Medicine, 1879; aged 75; died, August 23.

Libni Benjamin Hayman, Oakland, Calif.; Rush Medical College, Chicago, 1886; aged 72; died, August 12, of chronic nephritis.

Frank Worden, Alton, Ill.; St. Louis Medical College, 1876; aged 77; died, August 19, of cerebral arteriosclerosis.

George M. Morris, Idaville, Ind. (licensed, Indiana, 1897); aged 70; died, October 11, of cerebral hemorrhage.

Correspondence

SYMPATHECTOMY IN PARALYSIS AGITANS

To the Editor:—My attention has been called to a communication in THE JOURNAL (August 29, p. 663) on the subject of paralysis agitans. As the reply includes a reference to me, a statement from me may be of interest.

I formerly operated on the side of the lesion, with the result stated in the reply to your query, that is, a slight reduction of spasticity. Now I operate on the side of the lesion in the brain producing the vasodilatation of the vessels of that organ and obtain a contralateral diminution of tremor and loss of rigidity. Diminution of tremor occurs immediately after operation, but the tremor may not disappear for six or eight weeks. I have operated on eight patients with a complete loss of tremor in four and a considerable diminution of tremor in three; in the remaining one, tremor had been of long standing and the man was 58 years of age.

The explanation of the effect is this: It is well known that anoxemia or slight degrees of asphyxia produce hyperactivity of the central nervous system. By improving the circulation of the brain, there is depression of activity in the cells concerned in the production of tremor.

I shall shortly be publishing a paper on this work, probably in the *British Medical Journal.*

N. D. ROYLE,
Craignish, 185 Macquarie Street,
Sydney, Australia.

THE SPELLING OF "ENDAMOEBA"

To the Editor:—A paper on "Amebiasis Cutis" by Dr. M. F. Engman, Jr., and myself was published in the *Archives of Dermatology and Syphilology* for July, 1931. In the course of publication the spelling of the scientific name of the genus "Endamoeba" was changed to Endameba. When Dr. Engman asked to have the spelling changed back the reply stated that the American spelling was "Endameba." I am familiar with the American tendency to simplify the spelling of ordinary words, "ameba," for example, but I am puzzled by the policy expressed which changes the spelling of a scientific name, which is always printed in italics, from that which conforms to the International Rules of Zoological Nomenclature. In all American textbooks and scientific journals the name of the genus is spelled Endamoeba or Entamoeba. The choice between Endamoeba Leidy, 1879, and Entamoeba Casagrandi and Barbagallo, 1895, is a technical point which does not enter into the present discussion. I should appreciate knowing your point of view.

HENRY E. MELENEY, M.D., Nashville, Tenn.

[NOTE.—The press of the American Medical Association follows official nomenclatures of learned societies in such usages. Dr. Charles W. Stiles was asked to discuss the subject. He writes:]

To the Editor:—I have a great deal of sympathy with your point of view in regard to the diphthong so far as this concerns English words. When we are dealing with Latin technical names, however, the shortening of the diphthong results in great confusion and a tremendous amount of extra indexing and accumulative loss of money for the scientific world which must run into thousands of dollars. It becomes necessary to index names both with the diphthong and with the shortened form and in addition to this it places many names out of file when these begin with an initial diphthong and results in the creation of homonyms, therefore, in changing names unnecessarily. I think that a reasonable and practical compromise between the two extremes is to adopt the policy that the diphthong be shortened when the word is English, for instance, diarrhea, but the diphthong be used when the word is a Latin scientific name, for instance, Endamoeba.

A prejudice has arisen against diphthongs especially because of the similarity of ae and oe when certain fonts of type are used, for instance in France. The confusion here is easily obviated by avoiding the ae diphthong type which is so similar to the oe diphthong.

It seems to me that your journal is so important as an example to other journals that you would do well to lead in the general policy of endeavoring to prevent taxonomy from becoming a chaos of words. Accordingly, I venture to express the hope that you will write out the ae and the oe when these diphthongs occur in Latin technical taxonomic names.

The International Commission on Zoological Nomenclature has already ruled in favor of Endamoeba instead of Entamoeba.

C. W. STILES, M.D., Washington, D. C.

[Hence the American Medical Association Press will follow the International Commission on Zoological Nomenclature on such words.—ED.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

PURPURA, POSSIBLE LEUKEMIA AND ARTHRITIS

To the Editor:—I have a patient whom I saw first, May 15. At that time he was complaining of pain in the right trapezius muscle and on pressure over both condyles of the humerus. He gave a history of tonsillitis three months previously, followed by purpura of the legs, coming in crops with sometimes an interval between and sometimes overlapping each other. The purpura was confined to the legs below the knees. He had no pain in any other joints. He had lost about 11 pounds (5 Kg.) in the past three months. Urinalysis has been negative on several occasions. Blood pressure was 120 systolic and 75 diastolic, May 22. The last of May he developed hives on the upper part of the right arm, which lasted only a few days and have not since appeared. The last of July he came in with shingles on the right forearm. These also soon disappeared. His pain in the right shoulder got better at first but lately has become more and more severe, particularly when he lies down. Until the last few days he has been able to get relief for a time by standing up, but now the pain persists in any position. A blood count made the latter part of May showed a very low white cell count, 3,600, and another made a few weeks later was the same. Otherwise there was no abnormality in the blood count. The purpura reappears occasionally and has been confined to the lower part of the legs except on one occasion, when it reached to the groins. I have prescribed sodium salicylate, cinchophen, and a cinchophen-iodine preparation in succession, but none seem to have had any effect. He had one roentgen treatment over the right arm and lower cervical and upper dorsal spine, but the pain increased immediately after, and he refused more of this treatment. Lately, I prescribed codeine for pain, but 1 grain (0.065 Gm.) by mouth failed to produce relief. Today he came downtown and was taken sick, becoming dizzy and vomiting. I took him home and gave him morphine hypodermically for the pain. He is a man, aged about 35, short, but well built, and always before healthy. He used to be a wrestler. Have you any suggestions as to a form of treatment that will be effective in this case? If so, I will appreciate them.

W. STUART WOOD, M.D., Decatur, Ill.

ANSWER.—Several angles present themselves from a diagnostic standpoint. The persistent leukopenia in association with purpuric manifestations is highly suggestive of a leukemia existing in an aleukemic phase. Urticaria and tonsillitis are not infrequent concomitants of a leukemia, and tenderness over the bones may be elicited in some cases. The patient should be carefully examined for the presence of enlarged lymph nodes and an enlarged spleen. While in some cases the blood smears appear normal, in most cases immature leukocytes of the lymphocytic or myelocytic series are present in abnormal proportions. Careful and oft-repeated studies of the blood will ultimately reveal the hyperleukocytosis so characteristic of a leukemia, for the aleukemic phases are only transitory. A blood platelet count and tests of the coagulation time, bleeding time and retractility of the blood clot should be carried out to exclude a hemorrhagic diathesis with possible hemarthrosis of the shoulder joint.

In the absence of any abnormal blood conditions, an arthritis of the shoulder joint or of the cervical spine remains for consideration. Roentgenograms of these parts are valuable in revealing any hypertrophic bone changes.

The usage of cinchophen is to be interdicted because of the danger of producing grave hepatic destruction. A more useful form of therapy is diathermy or the therapeutic lamp applied to the shoulder or the cervical spine or to both, depending on the conditions revealed by the roentgen examination. The administration of codeine sulphate, one-half grain (0.03 Gm.), together with amidopyrine, 5 grains (0.3 Gm.), repeated at three hour intervals, often serves to mitigate the pain. Any focus of infection, such as teeth, tonsils, sinuses, prostate and seminal vesicles, is to be eradicated. Nonspecific foreign protein therapy, such as typhoid vaccine, has been of value in some instances. It is injected intravenously at three day intervals with a dosage at first of 5 million organisms per cubic centimeter, each successive dose being doubled. A reaction characterized by fever, chill and leukocytosis is desirable. Usually three or four injections are sufficient, but if no improvement ensues nothing may be accomplished by further injections.

POSSIBLE CRETINISM AND TREATMENT

To the Editor:—I have a small patient, aged 2½ years. She nursed normally from birth. It was difficult to give her other nourishment the first two years. During the past six months she has been eating normally. She is still nursing but gets little from her mother's breast. She is only a few pounds underweight; she does not talk but she can hum tunes which she hears on the piano. When the child was 6 months of age her mother was given one-half grain (0.03 Gm.) tablets of thyroid extract for two months, without appreciable benefit. The child has all her teeth and they are sound, regular and even. She seldom laughs. Her tongue protruded till she was 18 months of age. Her parents and four older sisters are all of more than average intelligence. What is her outlook? Any suggestions that may lead to the improvement of her mental condition will be appreciated.

L. W. DALLAS, M.D., League City, Texas.

ANSWER.—It is impossible to arrive at any definite conclusions from the information given as to the real condition present. There is every reason for weaning this child from the breast. Regular routine, consistent constructive training and well balanced diet are most essential under the circumstances.

The delayed mental development should be investigated thoroughly. Poor sight or hearing defects are not uncommon and may entirely account for lack of speech development. The protruding tongue suggests hypothyroidism. This condition may exist in relative degrees depending on the extent of the damage or defect in the thyroid gland. The facial expression—stupid, dull, coarse features—may be noticed early. Also the rough skin, coarse hair and retarded carpal development. The increase in adipose tissue and later the noticeably delayed physical and mental condition are easily recognized in the more marked cases, the cretin dwarf. Mongolian idiocy may be confused.

Specific treatment consists in the administration of some form of thyroid over a long period of time. The dose must be increased gradually until the desired effects are obtained. Metabolic studies may be difficult or impossible. The child's reactions are usually sufficient by which to gage the dose and length of treatment. The treatment is started early, as normal mental development is more likely. In the mild type a relatively short period of treatment may be all that is necessary, the thyroid gland developing to a sufficient degree. In the more severe cases, continued treatment will be necessary.

PERSISTENT VOMITING AFTER OOPHORECTOMY

To the Editor:—I have a patient who has had a bilateral oophorectomy and hysterectomy performed during the past two or three years. Since that time she has had a few vomiting spells, which have lasted four and five days. The last spell has lasted four weeks and she has persisted in vomiting everything taken. The barium series and a barium enema are normal. What treatment other than parenteral fluids and ovarian extracts would you suggest? Would ovarian extracts have to be continued permanently if they were found to help? Could you suggest anything else to help her psychic disturbances? Please omit name.

M.D., Texas.

ANSWER.—A thorough examination should first be made to rule out all the known causes of vomiting, especially gallbladder disease. The emesis in this case has most likely a distinct psychic factor and hence is only indirectly due to the castrating operation. Parenteral administration of fluids is not sufficient as a substitute for all the food this patient has vomited in four weeks. The fluid intake may be sufficient but food is most essential. The quickest way to give this patient not only liquids but also carbohydrates, fats, proteins, salts, vitamins, sedatives and almost anything else that is required is by means of a duodenal tube. Such a tube is easy to insert and may be left in place for days at a time. Not only will this treatment give the patient all the food she needs but it will have a large psychic effect. It is far from comfortable and therefore it may induce the patient to try to control the vomiting.

Ovarian extract would have to be given hypodermically as long as there is a tendency to vomiting, but the effect is highly doubtful. Here also some good may be accomplished because of the psychic effect. Another means of stirring up the patient's will power to control the vomiting is to use large, dull needles when giving fluids subcutaneously.

It must be borne in mind that if a patient retains no food for many weeks, a condition is produced which itself may cause vomiting. There is then a vicious circle unless food is given quickly and in sufficient amount.

SOUND PHASES IN DETERMINING BLOOD PRESSURE

To the Editor:—With regard to a query and answer entitled "Sound Phases in Blood Pressure Determinations," which appeared in THE JOURNAL, July 19, 1930, I should like to ask Which of the changing sounds is to be accepted as indicating the diastolic pressure? Can you explain the physiology of these various sounds and changes in sound? What is the significance of the various "phases" mentioned?

RAY REED, M.D., Niagara Falls, N. Y.

ANSWER.—The onset of the fourth phase of sound is accepted by most investigators as an indication of the diastolic pressure.

In determining the blood pressure by auscultation, five distinct sound phases can be obtained. The first phase consists of a sound not unlike the first heart sound ascribed to the water hammer effect of the impact of the blood column against the partially compressed vessel wall leading to vibrations from the sudden distention of the artery. The second phase includes in addition to this sound a hissing murmur. This is due to whirls and eddies within the vessel lumen. The third phase is characterized by disappearance of the hissing murmur and accentuation of the original sound as the vessel fills with more blood. The fourth phase is characterized by a muffling of the sound as a result of maximal arterial filling without compression of the vessel wall. The fifth phase occurs with the reestablishment of normal arterial flow and is characterized by disappearance of all sounds. The actual average duration of the phases measured in millimeters of mercury is 14, 20, 5, 6 in the order mentioned.

TREATMENT OF PANSINUSITIS

To the Editor:—In the treatment of chronic pansinusitis is vaccine therapy of any avail? If so, which vaccine and what is the dosage? Should these injections be given alone or should they be accompanied by local treatment, as suction and tampons? I should appreciate a detailed answer. Please omit name.

M.D., New York.

ANSWER.—It is not easy to see how vaccine treatment for the cure of chronic pansinusitis can be of any avail. Pansinusitis in some form occurring in connection with acute inflammation of the nasal passages is perhaps not at all uncommon. Unilateral pansinusitis is more unusual and often has its origin in infection about an upper molar, which begins an invasion of the sinuses by affecting the antrum. Perhaps the principal reason some of these cases of pansinusitis become chronic is that anatomic conditions or pathologic alterations prevent the drainage and impair the ventilation of an infected sinus. The first aim of treatment, therefore, is to establish proper drainage and ventilation by the correction of the anatomic and pathologic conditions causing obstruction. Vaccine treatment without these surgical corrections can hardly be expected to accomplish anything, and with proper surgical correction there is no need of vaccine treatment. The application of suction and tampons can be of no lasting benefit in situations of this sort.

USE OF HEAT IN TREATMENT OF GONORRHEA

To the Editor:—In THE JOURNAL, September 26, page 958, in an abstract the statements are made that with the apparatus mentioned a degree of heat of 130 F. can be had and maintained and that this temperature will kill gonococci and that the adjacent parts can be raised to this temperature. Will 130 F. kill gonococci and, if so, how long must this temperature be maintained? How deep into the genital tract will this temperature reach? In fact, please comment on the whole article. Please omit name.

M.D., Georgia.

ANSWER.—The report of Drs. Holden and Gurnee embraces an experience in the gynecologic service at Bellevue Hospital, New York. The apparatus consists of a rubber distensible vaginal bag through which water is introduced and maintained at any desired temperature and pressure. The authors state that a constant uniform temperature of 130 F. can be maintained for any length of time in the vagina. At the same time, with normal mouth temperature, the temperature in the urethra is

104, in the bladder 104.1, in the posterior rectal wall 104, and in the cervix 112. As Pelouze states that cultures of gonococci will survive at 113 F. for thirty minutes, surely 130 should kill the gonococcus instantaneously, but the gonococcus does not remain latent in the vagina.

Gonorrhea persists in women largely because of the continued presence of the gonococcus in the para-urethral, the cervical and the endocervical glands. As the authors clearly state that the surrounding tissue is never heated above 112, it is fair to presume that the benefit derived from the long continued heat is due to a stimulation of the patient's local defensive mechanism (histiocytes and polymorphonuclear leukocytes), which destroy the gonococcus, rather than a direct thermic effect.

INFECTED URETHRAL FOLLICLES

To the Editor:—I have two patients with chronic urethritis whose only symptoms are large and heavy shreds and filaments in the first portion of the urine. One did not have sufficient treatment during the acute stage and the other had none at all, about a year ago. There is no discharge, the prostatic infection cleared up under treatment, and there are no subjective complaints. Instillations, sounds, and urethroscopy were applied and consultants were asked; still the condition shows no improvement. The textbooks all state that this condition is caused by the devitalized mucous membrane, but none of them offer a specific therapy. Please omit name. M.D., New Jersey.

ANSWER.—Assuming, as the correspondent states, that the prostatic infection has been cleared up, the persistence of the shreds is probably due to the presence of either granulations or infected urethral follicles. This can best be determined by a careful urethroscopic examination. If the cause is infection in the urethral follicles, they should be destroyed with the high-frequency spark, and if due to granulations, they may be treated in the same manner.

BIRTH OF ONE CHILD AFTER TWIN MISCARRIES

To the Editor:—In "Merrily I Go to Hell—Reminiscences of a Bishop's Daughter," by Mary Cameron (Brentano's, 1931) this statement is made: "Three months before I was born, my mother miscarried a boy baby and at the appointed time I made my unethical appearance." To what extent is one justified in believing this?

H. G. BULL, M.D., Ithaca, N. Y.

ANSWER.—This statement can be true because occasionally a fetus is expelled during the early months of pregnancy, and a few months later a normal full-term child is born. Usually, of course, when one fetus of twins is expelled prematurely the other one follows shortly afterward. It is also usual, when one of twins or triplets dies in utero, for it to remain within the uterus until term. At that time when the full-term normal child or children are born, the dead fetus is expelled. At this time it presents the appearance of a flattened, dried, shriveled fetus much smaller than the living children and it is known as a fetus compressus or fetus papyraceus.

PRESCRIPTION OF POTASSIUM IODIDE

To the Editor:—Will potassium iodide act the same as sodium iodide? If so, please write a prescription that will contain potassium iodide 10 drops and belladonna 5 drops. Please write prescription in drops, grams and ounces. CARL J. SNITKAY, M.D., Belle Plaine, Iowa.

ANSWER.—Potassium iodide has the same effect as sodium iodide. Assuming that the prescription desired is to contain 0.6 Gm. (10 grains) of potassium iodide and 0.3 cc. (5 minims) of tincture of belladonna, it would be written as follows:

		Gm. or Cc.	
℞	Potassium iodide	15	ʒ v
	Tincture of belladonna	7.5	ʒ iiss
	Compound tincture of cardamom	5	ʒ iss
	Diluted alcohol to make	100	ʒ iv

M. Label: Teaspoonful in water three times a day after meals.

STERILITY PRODUCED BY ROENTGEN RAY

To the Editor:—You publish a physician's question regarding temporary sterility produced by the roentgen ray (THE JOURNAL, October 10, p. 1095). Your answer refers the correspondent to a skilled roentgenologist who has had experience with temporary roentgen castration. May I call your attention to the fact that at present nobody has this experience. There are reasons to believe that the consequences of temporary rpentgen sterilization may manifest themselves no sooner than in the second generation, which means the offspring of the patient's children. Pending the decision of this question, I feel we should follow Martius of Germany, who advises either permanent roentgen sterilization or none at all (*Strahlentherapie* **41**: 47 [June 13] 1931).

SIEGFRIED W. WESTING, M.D., Brooklyn.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Clinical.* Chicago, Dec. 29. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Boston, Dec. 21. Sec., Dr. Wm. H. Wilder, 122 S. Michigan Blvd., Chicago.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, Dec. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Endorsement.* Hartford, Nov. 24. Sec., Dr. Thomas P. Murdock, 147 West Main St., Meriden.

DELAWARE: *Regular and Homeopathic.* Wilmington, Dec. 8-10. Sec., Dr. Harold Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: Washington, Dec. 29-30. Sec., Dr. W. C. Fowler, District Building, Washington.

FLORIDA: Jacksonville, Nov. 23-24. Sec., Dr. Wm. M. Rowlett, 812 Citizens Bank Bldg., Tampa.

KANSAS: Kansas City, Dec. 8. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 1-3. Sec., Dr. A. T. McCormack, 532 West Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 8-11. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Dec. 17-18. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

NEBRASKA: Lincoln, Nov. 23-24. Act. Sec., Mr. P. H. Bartholomew, Lincoln.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 7. Sec., Dr. John W. MacConnell, Davidson.

OHIO: Columbus, Dec. 8-10. Sec., Dr. H. M. Platter, 85 E. Gay St., Columbus.

TENNESSEE: Memphis, Dec. 18-19. Sec., Dr. Alfred B. DeLoach, Medical Arts Bldg., Memphis.

UTAH: Salt Lake City, Dec. 1-2. Dir., Mr. S. W. Golding, 412 State Capitol Building, Salt Lake City.

VIRGINIA: Richmond, Dec. 8. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke.

WEST VIRGINIA: Morgantown, Nov. 19-21. Sec., Dr. W. T. Henshaw, Charleston.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 19. Sec., Prof. Robert N. Bauer, 3414 West Wisconsin Ave., Milwaukee.

Arkansas Eclectic Report

Dr. Claude E. Laws, secretary, Arkansas Eclectic Board of Medical Examiners, reports the written examination held May 12-13, 1931. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. The following college was represented:

College	PASSED	Year Grad.	Per Cent
Kansas City College of Medicine and Surgery		(1922)	94.5

Georgia June Examination

Dr. B. T. Wise, secretary, Georgia State Board of Medical Examiners, reports the written examination held at Atlanta and Augusta, June 10-11, 1931. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Sixty-eight candidates were examined, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Howard University School of Medicine		(1931)	90.2, 90.4
Emory University School of Med.	(1930) 86.5, 94.7, (1931) 89.4, 89.8, 90, 90.1, 90.3, 90.5, 90.8, 90.9, 90.9, 90.9, 91, 91.1, 91.9, 92.1, 92.1, 92.2, 92.3, 92.3, 92.7, 92.8, 92.8, 92.9, 93.4, 93.5, 93.6, 93.8, 93.9, 94.5, 94.7, 95.1		
University of Georgia Medical Department		(1931)	88.5, 89.7, 89.7, 90.1, 90.6, 90.7, 90.8, 91.1, 91.7, 92, 92.2, 92.2, 92.4, 92.5, 92.7, 92.7, 92.7, 92.9, 92.9, 93.1, 93.2, 93.3, 93.8, 94, 94.2
Rush Medical College		(1931)	94.5
Meharry Medical College	(1930) 89.5, (1931) 88.3, 88.6, 88.7, 88.8, 89.4	(1929)	88.4,
University of Edinburgh Faculty of Medicine		(1929)	94.5

Dr. Wise also reports 10 physicians licensed by reciprocity with other states and one physician licensed by endorsement from Feb. 23 to Aug. 31, 1931. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1929)	Arkansas
Howard University School of Medicine		(1929)	Ohio
Emory University School of Medicine		(1930)	W. Virginia
University of Georgia Medical Department		(1927)	Missouri
Tulane University of Louisiana School of Medicine		(1920)	Louisiana
Baltimore Medical College		(1905)	Dist. Colum.
University of Michigan Medical Department		(1924)	Michigan
University of Cincinnati College of Medicine		(1925)	Ohio
Vanderbilt University School of Medicine		(1924)	Louisiana
Licentiate and Member of the Royal College of Phys., London, and the Royal Coll. of Surgs., England		(1908)	Nevada

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1928)	N. B. M. Ex.

Book Notices

Studies of Nutrition: The Physique and Health of Two African Tribes. By J. B. Orr and J. L. Gilks (for the Dietetics Committee of the Economic Advisory Council). Medical Research Council, Special Report Series, No. 155. Paper. Price, 2s. Pp. 82. London: His Majesty's Stationery Office, 1931.

This is a contribution to knowledge concerning the relation of diet to physique and to health. The two tribes selected for this investigation were chosen because of the fact that, although their territories were adjoining, their dietary customs were different, "the Akikuyu being almost exclusively vegetarian and the Masai chiefly carnivorous." The field work in this investigation covered such categories as chemical analysis of all foods in common use, articles of diet in the raw state, cooked foods, edible earths, physical examination of both adults and children, and clinical observations. Additional features of this study pertain to laboratory and hospital work dealing with the adequacy of hospital and prison diets, the effect of additions to the diet of various seemingly desirable supplements, feeding tests with prescribed diets on four groups each of forty boys, and blood studies dealing particularly with calcium and phosphorus content, sugar tolerance, p_H and alkali reserve, blood pressure and cell counts. The subject of tropical ulcer received considerable attention in an endeavor to make positive contributions to the problem of its etiology.

It was found that the diet of the Akikuyu or vegetarian group consisted largely of cereals, roots and fruits, the bulk of the diet being cereals. The Masai tribe subsisted on a ration that consisted to a large extent of milk, meat and raw blood. As might be expected, the principal points of difference in chemical composition of the two diets were that the Masai had a relatively high intake of protein, fat and calcium, whereas the other tribe had a high intake of carbohydrate and one low in calcium. There were interesting dietary habits which resulted in a better ration for the women and children of the vegetarian tribe, such as a relatively high intake of certain green leaves, which were found on analysis to be unusually rich either in calcium and sodium or in iron; ingestion of these leaves by the males was considered to be undesirable.

Physical measurements showed the full-grown Masai male (belonging to the carnivorous tribe) to be on an average 5 inches taller and 23 pounds heavier than the full-grown male Akikuyu, and his muscular strength, as determined by the dynamometer, to be 50 per cent greater. There were other marked differences noticed, such as a greater incidence of bony deformities, dental caries and anemia, pulmonary conditions and tropical ulcer among the vegetarian tribe, in contrast to a greater prevalence of intestinal stasis and rheumatoid arthritis among the Masai or carnivorous group.

The marked lack of calcium in the vegetarian diet was found to be associated with a definitely lower level of blood calcium. Additions of calcium salts, cod liver oil and milk made to the routine prison rations were followed by an increased retention of calcium. Cod liver oil had no definite effect on the calcium balances. In the adult subjects receiving additional calcium or cod liver oil in the diet the level of blood calcium was raised.

Dietetic treatment of tropical ulcer cases gave no definite result. As the state of nutrition of the patient improved, the ulcer tended to heal more quickly; but no effect of especial importance could be attributed to any of the supplements tried. On the whole the authors of this report favor the view that deficiencies in the diet, abnormal composition of the blood and reduced susceptibility to certain diseases, which were noted in the vegetarian tribe, may be correlated.

The data on which this report is based are presented in eight tables and eleven graphs, which are sufficiently detailed to satisfy most students in this field. This investigation will be of particular interest to those (1) who advocate a vegetarian regimen, or (2) who feel that the inclusion of meat in the diet is desirable, but will not satisfy the extremists in either of these groups. Students of anthropology and psychology will find much of interest here, particularly in relation to the development of food habits.

The Care of the Chronic Sick in Private Homes for the Aged in and near New York City. A Section of a Study of Provision for the Care of the Chronically Ill in New York City. By Mary C. Jarrett. Study 5 of the Research Bureau of the Welfare Council. Paper. Pp. 67. New York: Welfare Council of New York City, 1931.

Increasing attention has been called to the problems of chronic illness, particularly to its care in institutions, by such writers as Dr. Ernest P. Boas of New York and by numerous foreign physicians. This booklet presents some of the results of an extensive study or "census" of chronically ill persons in New York, of whom a total of 20,754 were registered. More than a third of these were over 60 years of age and nearly one third were children. A considerable proportion of the children with chronic illness were cared for in their own homes by visiting nurses, whereas the aged with chronic illness were mainly in institutions and particularly in the privately supported homes for the aged. It is rather remarkable that in New York privately supported homes for the aged are caring for a larger number of chronically ill persons over 60 years of age than all the homes for the aged supported by the municipality, and many times more than the public and private hospitals. Many of the homes for the aged announce that they do not take persons who have chronic illness; nevertheless the facts show that nearly half of all their guests are chronically ill and have been so ever since they were admitted to the home. Instances of almost every chronic disease were found, the most frequent being physical disabilities due to old age and to diseases of the heart. It was found that many of the homes for the aged were not equipped for giving chronically ill persons the medical care they need. Some of the guests who needed medical care were not receiving it and others were receiving it for whom mere custodial care would have been sufficient. More than a third of all the chronically ill guests were being furnished unsuitable care, one third of these receiving more intensive and expensive medical care than was necessary and the other two thirds receiving inadequate service. Better distribution and rearrangement of facilities are pointed out as the immediately practicable steps rather than the enlargement of the number of beds for chronically ill and aged persons. Since New York State made effective in 1931 a law providing allowances for dependent aged persons, many of those who are not chronically sick can hereafter be cared for in their own homes or in the homes of others. Thus an increasingly large proportion of the work that will fall on the homes for the aged will be the care of the chronically ill who need a degree of medical attention which a private home cannot provide. Physicians and institutional administrators in all the large cities of the country will find much of suggestion in this booklet.

Die Chirurgie der Brustorgane. Von Ferdinand Sauerbruch. Band I: Die Erkrankungen der Lungen. Teil 2: Chirurgische Behandlung der Lungentuberkulose. Geschwülste der Lungen, Echinokokkus der Lungen, Aktinomykose und andere Pilzerkrankungen der Lungen. Chirurgische Behandlung des Asthma bronchiale. Syphilis der Lungen. Von H. Alexander, H. Chaoul und W. Felix. Third edition. Cloth. Price, 98 marks. Pp. 917-1373, with 189 illustrations. Berlin: Julius Springer, 1930.

This volume is the second part to appear of the third edition of Sauerbruch's treatise on surgery of the chest. The first edition of the work appeared in 1911 and consisted of a single volume of only ninety-seven pages. The second edition consisted of two large volumes, totaling 2,006 pages, the first volume of which appeared in 1920 and consisted of 931 pages. In the latest, or third, edition, the first volume now consists of two parts or volumes, together totaling 1,373 pages. This was necessitated by the growth of the material. This is the second part of volume I and consists of 456 pages. It deals essentially with the surgical treatment of pulmonary tuberculosis, about one third of the volume being devoted to this topic. The other subjects dealt with, echinococcus, actinomycosis, aspergillosis and syphilis of the lung, and the surgical treatment of bronchial asthma, together cover only thirty-four pages. The remainder of the book consists of the bibliography and index for both the parts of the first volume. The bibliography alone comprises nearly a third of this entire new part. There was great need of this edition as the result of increased experience and extension of the field. The new edition, in general, resembles the second, and deals with the pathology and clinical aspects of the diseases of the chest. Only those operative procedures are described which the author uses and has found of value. The surgical

treatment of pulmonary tuberculosis is exhaustively presented. This is the most valuable portion of the volume. The other pulmonary diseases are less exhaustively dealt with. The chapter on actinomycosis is disappointing. The cutaneous test and the agglutination test are not even mentioned. Otherwise, the volume is up to the high standard expected of such a master as Sauerbruch. The volume contains an enormous mass of valuable information presented in a beautiful manner. The text is enhanced by numerous photographs of actual cases, roentgenograms, and wash drawings. The latter are often partly in color and these are used particularly in explaining the details of operative procedures and make these extremely clear. This completes volume I, a most valuable addition to the literature on chest surgery, which should be available to all who are working seriously in that field. It is the largest and most scholarly presentation of chest surgery that has yet appeared in any language.

The Home Care of the Infant and Child. By Frederick F. Tisdall, M.D., M.R.C.S., L.R.C.P., Attending Physician, Hospital for Sick Children, Toronto. Cloth. Price, $3. Pp. 292, with 58 illustrations. New York: William Morrow & Company, 1931.

This is one more book added to the large number available on the subject of the home care of the infant and child. The success that such a book may have depends on the simplicity of presentation and the extent to which the material holds the mother's interest. Its usefulness depends on the explicit nature of the procedures outlined and the instructions given. The illustrations play a great part in stressing the important points on the mother's mind. This book meets all these requirements. The illustrations are clear and the material is written in a simple style. The instructions given are explicit. It has some interesting material well presented concerning the behavior problems and the play life of the child.

Chirurgie du rectum. Par Henri Hartmann, professeur honoraire à la Faculté de médecine de Paris. Trauvaux de chirurgie. Huitième série. Paper. Price, 75 francs. Pp. 398, with 161 illustrations. Paris: Masson & Cie, 1931.

This book is a modernization of the book on diseases of the rectum published by Quénu and Hartmann in 1895. Throughout the text the reader is impressed with the sound pathologic-anatomic background. Disease processes are clearly defined and consequently the diagnosis of some of the more obscure infectious processes observed in the rectum is made more obvious, as in the chapters on fistula in ano and strictures of the rectum. The author makes a practical suggestion in the treatment of bilateral ischiorectal abscesses, which if opened laterally to the anus result in a horseshoe fistula because of the fact that almost all these bilateral abscesses originate on the posterior wall of the rectum from a single lesion (injury or ulcer). With this pathologic-anatomic fact in mind, Hartmann suggests that the abscesses be drained by dividing the sphincter in the posterior line. This allows free drainage of both ischiorectal fossae and precludes the development of a complicated fistula. In like manner, pathologic processes underlying stricture of the rectum are considered. Of 120 cases of so-called venereal stricture, 43 were undoubtedly syphilis. Almost all the different methods of treatment of this condition are reviewed with a conclusion that traumatic dilation is useless and that colostomy is the best treatment in advanced cases. The chapter on cancer of the rectum is encyclopedic in that a critical review of most operative procedures for removal of the cancer is given. The author's own preference of operations is not in accord with the view of most surgeons of the day. In general the book is valuable and represents the experience in this field of one of the most experienced surgeons in France.

Breast-Feeding. By Margaret Emslie, M.B., Ch.B., Medical Officer, Southfields Centre. Cloth. Price, $2. Pp. 142, with illustrations. New York: Oxford University Press, 1931.

There is no doubt about the value of breast feeding for the health of the baby, as well as that of the mother. There are numerous causes for failures in breast feeding, many of which can be avoided. In this book the management of breast feeding and the difficulties encountered are thoroughly discussed. The anatomy and physiology of the breast and the abnormal conditions that may develop during breast feeding are also given consideration. In the appendix is a discussion of sore nipples and their treatment.

Die skrofulöse Augenentzündung. Von Prof. Dr. A. Siegrist, Direktor der Universitäts-Augenklinik Bern. Paper. Price, 8 marks. Pp. 68, with 36 illustrations. Berlin: Urban & Schwarzenberg, 1931.

This booklet deals exclusively with the condition known in this country as phlyctenular ophthalmia, which name the author objects to as not being as significant as "scrofular." In the preface he states that this is not a chapter from one of the large handbooks but rather an isolated work dealing with the condition largely from a clinical standpoint. Etiologically, he emphasizes that "the disease has as its basis scrofulosis, which is an individualistic type of tuberculosis in the allergic stage; but in order that scrofulosis may produce the multifold types of ocular manifestations, it is necessary that there be added exciting factors, mostly in the form of exogenous irritations of diverse character." But in describing the pathologic anatomy he states that in the fresh cases neither tubercle bacilli nor other micro-organisms have ever been found, nor has it been possible to find tubercle bacilli in experimentally produced phlyctenules. The clinical descriptions are short but good, and sufficient space is devoted to the therapy, both local and general. The black and white illustrations are mostly facies and periocular skin lesions, while the colored illustrations demonstrate the ocular lesions of phlyctenular ophthalmia. The latter are good except that the reds and yellows are a little too pale. For one practicing in a community where phlyctenular disease abounds, much good can follow a careful perusal of the booklet.

Dynamic Retinoscopy. By Margaret Dobson, M.D., Ophthalmic Surgeon to the New Sussex Hospital for Women, Brighton. Cloth. Price, $2.50. Pp. 56, with 11 illustrations. New York: Oxford University Press; London: Humphrey Milford, 1931.

The author presents the fundamentals of dynamic retinoscopy in contrast to static retinoscopy in a brief but concise manner. The various types of retinoscopes, both American and English, are minutely described and their advantages and disadvantages commented on. The author's dynamic retinoscope is given particular emphasis. It consists of a typical electric retinoscope with a small revolving disk which contains various small figures and letters electrically illuminated by a special device and situated just below the reflecting mirror, and is the object which the patient fixes on when the presbyopic error is estimated. The various heterophorias and the tests for them are thoroughly explained, although there is nothing new offered as to their treatment. Considerable emphasis is placed on the differentiation between accommodation and convergence. Dynamic refraction differs from static refraction in that it is a method of examination for measuring the refraction of an eye, by means of a shadow test, with some convergence and accommodation in force. The author states that the object of dynamic retinoscopy is to bring about a binocular adjustment between accommodation, accommodative convergence, and fusional convergence, which results in easier and better vision by producing a balance from the standpoint of innervation, which she believes is not taken into account in static retinoscopy.

Documents pour servir à l'étude de la vaccination préventive de la tuberculose par le B C G en France. Institut Pasteur, laboratoires de recherches sur la tuberculose. Deuxième enquête: Janvier-Mars, 1931. Paper. Pp. 124. Paris: Masson & Cie, 1931.

This pamphlet contains an introductory outline of the history of B C G, which will prove useful to those who have not followed the original literature and frequent reviews on this subject. It is frankly argumentative and propagandist, with admitted bias. The opening chapters are followed by brief documents from the several departments of France indicating the extent to which B C G has been used. Many of these are supplemented by short favorable quotations from those who have administered the vaccine. Not a few of these emanate from midwives, and all are of the testimonial type in disrepute in this country. They will not be taken seriously by a scientific reader, except as evidence of widespread and genuine good will toward the method in France. The tabulated material indicates the extent of usage in France rather than success of the method. In the six pages devoted to recording the success in other countries, the figures for mortality in the nonvaccinated as compared with the vaccinated are impressive, but the records are much too brief for critical analysis. Presumably this will be supplemented by other reports.

Miscellany

THE HUMAN SIDE OF THE HOSPITAL*

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In compliance with the custom of having your president begin the annual meeting of this association with an address, I should like to direct your attention to a subject that has not been discussed as freely, it seems to me, as it might be; i. e., The Human Side of the Hospital, and especially of a children's hospital. In doing so I hope that it may be obvious that I am speaking the language of sentiment and not of sentimentality.

After an extended experience with a dozen widely differing hospitals, as intern, attending physician, visitor and patient, my attitude toward a given hospital centers in the emotions, in the heart, rather than in the mind, and I believe that reaction is freely shared by others. I think it was Napoleon who said, and marvelously exemplified the truth of that saying, that the important thing, the determining thing, in an army was the Imponderabilia, "the things that are not capable of sensible weighing," as Webster puts it. In other words, it is not the number of men, nor of cannon; not the idealness of equipment and of organization but the subtler spirit of enthusiastic and self-effacing cooperation, of steadfast, sympathetic loyalty and devotion to a common cause that is bigger than any individual, that wins battles and makes hospitals. It is the atmosphere, the morale of a hospital, that makes or wrecks its reputation and its usefulness. The children may be well cared for; the medical staff may be made up of able clinicians and investigators; the superintendent may be as wise as Solomon and as "just" as Aristides, and may see that the whole machinery of administration is well oiled and the physical equipment faultless; the board of trustees and the women's board may be actively interested and may do all that could be desired in other ways; the nurses may be intelligent, faithful and well trained; the interns and residents may be well schooled and prepared for their duties, may, indeed, get up at seven and be at breakfast on time; and yet the vital spark will be lacking if there is not back of it all an all-pervading spirit of cooperation and of kindliness or, as Emerson has so beautifully expressed it, "an element of love that permeates it like a fine ether."

There are, unfortunately, many things that militate against the happy fruition of that ideal. Self interest is still a dominant note in human conduct. Human nature is much the same in hospitals as elsewhere—sometimes, I think, a bit more so. A learned anthropologist recently announced that in his basic emotional reactions man had not advanced beyond the cave man period. Medical jealousies seem hard to keep down and factions do arise. The superintendent's job is not a thornless bed of roses. It merits our whole-hearted sympathy and consideration—I am tempted to say condolence. To steer serenely between Scylla and Charbydis, between the check book on one side and the medical staff with its unquenchable wants on the other, alone requires a skilful and a tactful mariner, whose compensation must often be looked for in the feeling of a job well done rather than in unstinted appreciation or gratitude. The lack of a clearly recognizable line of cleavage between medical and administrative authority often leads to a "strain" of "the quality of mercy," even in the best intentioned. True, there are some superintendents, just a few, who fail to observe even the most evident line of cleavage and I believe that there are some medical men, just a few, who are at times a bit unreasonable.

While the cordial, well balanced, sympathetic, cooperative and understanding interrelation of the factors that enter into the efficient conduct of a hospital is vital and necessary to the realization of an approximate ideal, my present interest is even more in the effect than in the cause, in the patient, and, in this connection, his mother, than in the organization that ministers to him. After all, the patient's the thing. Other activities, no matter how important, are but subsidiary outgrowths of that prime function of the hospital. And it is the reaction of the patient and of his parents that is the ultimate yard stick, from our present standpoint, by which the hospital is measured.

I can perhaps best illustrate what I am about to say from another sphere. I go to a hotel in a strange city. The door man meets me to open the door of my taxi; the bell boy comes forward eagerly to take my bag and stays attentively by my side until I am settled. The room clerk patiently bears any amount of inconvenience in seeing that I get just the room I want. The boy accompanies me to my room, opens the windows, sees that there are plenty of towels and matches, and in general so radiates service that only an established convention would seem to justify a tip. In the morning I find a complimentary newspaper under my door. The head waiter meets me immediately and cordially conducts me to my table and when he asks me later if everything is all right I say "Yes" even if the cantaloup has been the usual disappointment. I am an important person here. I am welcome at this place, they are glad to see me; I can't help feeling it on all sides. Here is a huge, complex, many-sided institution that is bending every perfectly organized effort to make me feel comfortable and at home—in other words, to render most efficiently and cordially and evidently the service for which it was intended.

Again, I go to a store. The floor walker meets me half-way to ask my needs. The clerk is attentive and unwearying, no matter what her thoughts may be or how much her arches may ache. Too, if there is any dispute in the better shops "the customer is always right." I get the same service at the movie; and at the gasoline station service is forced upon us, and with no expectation of a tip.

Now, the hotel and the store and the movie and the gasoline station are merely selling merchandise and service for a fixed price, and the cordiality may or may not be based on ulterior motives; but that in no way lessens my appreciation of an interested and attentive and immediate service.

Is all that I have said of these other activities equally true of the hospital along these lines? Is the service it renders as obviously satisfactory at all times? Has the patient, or, in this instance, the patient's mother, the same frankly kindly feeling toward the hospital? It is a matter of common experience, I think, that there is only too often a feeling of discontent—silent or expressed—and even of irritation, resentment and antagonism. Only too often patients hesitate, or even refuse, to go to a certain hospital again because they have once been there. The question naturally arises: "Why is it that an institution builded on sentiment and on a spirit of service to the physically and mentally unfortunate and sick and suffering fails more often to achieve, fully, its whole purpose as compared with the hotel and the store and the movie and the gasoline station?" There are several perfectly obvious mitigating reasons.

In the first place a hospital, like any other machine, is as weak as its weakest part. Many factors enter into the care of a patient, some of them beyond the control of the best intentioned, with a mother naturally and normally hypercritical and single-eyed in her interest. Somewhere between admission and discharge there is apt to occur a slip, an unfortunate experience, a misunderstanding about the bill, especially that laboratory fee and "the incidentals," a seemingly inexplicable delay or procedure; or, possibly, an encounter with the vanishing but still occasionally found hard-boiled nurse who is more interested in the orderliness of her linen closet and her daily routine than she is in the comfort of her patient; or with the equally occa-

* From the Children's Memorial Hospital.
* President's address, read before the Children's Hospital Association of America, Toronto, Ont., Oct. 1, 1931.

sional intern who sees in the child a sort of impersonal object from which to extract a maximum of experience; or even more with that anachronous modern representative of the laws of the Medes and the Persians, the inflexible hospital rule, or routine. In her present state of mind the mother accepts the good as the natural course of events; she finds it hard to grasp what seem to her inexplicable deviations from the usual human conduct to which she is accustomed when in trouble.

There is a deeper reason. The mother who brings her child to the hospital knows little, or nothing, often less than nothing, about medicine or disease or the mortality rate of the present illness, and the whole world centers for the time being about that one child and his illness. Before coming to the hospital she has had the deep sympathy, freely expressed, of her friends and relatives, and her family doctor has also been the kind and sympathetic friend who has sought intelligibly to lessen the pangs of fear and uncertainty by wise and thoughtful information as to the real status of things. If she still has the optimism of inexperience she will perhaps expect an equally sympathetic and responsive reaction and an immediate, obviously adequate attention to this most important matter now before the world. Abruptly thrust from one environment into the other she will often feel that chilling, paralyzing, feeling of aloneness, of inferiority, of insignificance and helplessness that grips many of us in the presence of a new, strange, large and highly organized and routinized environment, as she faces instead of the warm, sympathetic, responsive, individual, personal human heart, that she has known up to this time, the collective, impersonal, mechanical, seemingly unfeeling, routine institutional heart. A sort of fatalistic emotion possesses her—the fate of her child lies "in the laps of the gods" and they do not seem adequately, personally, humanly impressed with the necessity of doing everything just right and, even more important, at just the right time. There are many strange and diverse activities on all sides that seem utterly to ignore her presence and that make her fear that somewhere her child may fall in between the parts of a system that does not seem perfectly organized for her immediate needs. It is at just this point that a little kindly assurance that all is proceeding in orderly fashion will go a long way to humanize the institution.

The real crux of the matter lies in still another direction. "Use does breed a habit in a man." Surrounded by sickness and suffering on all sides we get used to it and pursue the usual "tenor of our way" much as if they did not exist. What to us is a natural and necessary adaptation to such an environment may to an anxious parent who has but one interest seem callousness and indifference. Early in my practice I nearly lost a most important and much needed family because the father peeked through the door of the operating room and saw me smiling at something while his child was having her tonsils removed. If I had known he was looking I would not have smiled. In his Ars Poetica somewhere Aristotle laid down as a fundamental law that the effect of the drama lies in its ability to make the hearer imagine himself in the place of the character portrayed. It seems to me that that thought can fruitfully be transplanted to the present theme. Most of us at one time or another, in the presence of sickness in some one near to us, have suddenly been gripped by the fear that "perhaps this is one of those cases that ends wrong." Does not nearly every mother, every father, who bring their child to a hospital for nearly any illness, have that feeling in nearly every instance? Do they not feel it even more keenly than we under like circumstances, because, as one mother once said to me, "You at least know something about what to expect—we know nothing and can only expect the worst." That her reasoning was perhaps not wholly founded on a rock is attested by the well known traditional reaction of doctors and ex-nurses when their own children are sick. We cannot wear our hearts on our sleeves, we cannot and must not feel as deeply as she does the mother's fear and anxiety, and yet it does seem a strange inconsistency that we weep over the fictitious tragedies of the novel, the stage and the movie, while the stark tragedies of real life by which we are surrounded at all times in the hospital seem to touch a less quick, less responsive and less obvious chord. The whole world rises in spontaneous sympathy and the resources of nations are mobilized to save a man who lands on an ice floe in the arctic, or in some unknown place in the sea, or is caught in a cave in Kentucky. Is not a mother entitled to the same feeling of assurance, when her child's life seems at stake, that all the resources of the hospital are visibly and evidently marshaled for that one supreme event? Has she not a right to expect at least as sympathetic, cordial and personal attention in a hospital as she gets in a hotel, a store, a movie or a gasoline station, where only a room and board, an hour's entertainment, and perhaps a bargain are at stake? Only too often if she demands what to her seems perfectly evidently her right to demand she will find that in some hospitals "the customer is not always right." The anxious mother, instinctively fighting the age-old biologic fight for her young, will sometimes find herself dubbed a "fussbudget" in the hospital.

If what I have said represents in some measure a true situation, what is the remedy? I would sum it all up in one word—"tradition." There are hospitals of which it is traditional that kindliness, attentiveness, thoughtfulness, flexibility in its conduct, and an evident spirit of cooperation and of service prevail throughout. There are others in which an obviously impersonal and inflexible chilling routine obtrudes itself. As Cushing has so well said, "hospitals have personalities." A very human clinician once told me how different he felt now about medical procedures than he did as an intern in one hospital in which he did the most daring things in a perfectly impersonal cold-blooded manner that he would not think of doing now as attending physician in another hospital unless absolutely necessary. In each instance he merely reflected the traditions, the personalities, of the hospitals in which he worked. Doubtless, too, a wife and a baby and the personifying, humanizing influence of private practice had much to do with it. I know of a hospital that in no other way rises above many others, of which I was recently told from an authoritative source that patients left it more satisfied and enthusiastic than from any other hospital within the knowledge of my informant. From personal contact with that institution I can understand that reaction. The superintendent of the hospital and the head of the training school not only show, but have, a personal interest in the patients and their comfort, make rounds to make sure that all is well, even call on some of them and say a few words in selected cases. I am not advocating this practice; I am merely recording a fact. I am inclined to think, however, that the swivel chair sometimes serves best if at times unoccupied.

I cordially dislike the idea of "setting a good example." It was the Pharisees who prayed aloud in public that they might be seen and heard. The right man and the right woman in the high places do not *set* a good example; they *are* a good example and they radiate a beneficent influence because they do not assume, but *have*, a human interest in the human side of the hospital. The individual is the force that molds traditions, be he superintendent, medical chief, head of the training school, a dominant clinician, a resident, or a member of the board of trustees or of the women's board. Dr. Abt has characteristically expressed this at one of our former meetings: "The administrative heads of a hospital are largely responsible for maintaining the atmosphere and morale of the institution. If the atmosphere is one of cheerfulness, kindness and cooperation, nearly every member of the organization will be inoculated by this spirit which flows from the high points." The medical chief is in an analogous position. The clinician who is human and personal and not merely medical, who always has time to say a reassuring word to the mother and to the patient, who

is as interested in the patient as he is in his pathology and in a possible autopsy, whose very presence and example forestall any possible lack of kindness or thoughtfulness toward the patient or his mother, radiates an influence among nurses and interns that no set of rules can ever approximate. One of the greatest and busiest surgeons that I ever knew spent just as much time and was just as careful not to cause any unnecessary pain during a dressing on the humblest colored child in the ward as he was with the richest and most influential patient in the most expensive suite in the hospital, and we young interns and nurses never forgot it.

But it is not only those in the high places that radiate such influences. First impressions are strongest and most lasting and the man or woman in the "front office" exerts an influence for weal or woe, depending on whether he is attentive or indifferent, cheerful or glum. A "greeter," now a part of the official welcome in some of our cities, and already installed in some hospitals, notably the one referred to, if well chosen might accomplish much. Like the poet, however, he "must be born, not made." The largest contact with the outside world is that of the telephone operator. The value of an ever cheerful, interested, patient, forbearing, intelligent and abiding operator, who rises serenely above the petty annoyances inseparable from that post, cannot be measured too closely in terms of dollars and cents alone.

Intimately related to all this is the very important problem of how best to give information as to a patient's condition, both directly and over the telephone. Nurses are necessarily restricted in the matter, interns and residents cannot be called from their work at all hours, the written report available to the office or the telephone operator is at best diluted and vague and sometimes misleading, and never wholly satisfying. Some method by which first-hand information could be given by the intern, or resident, in all serious or doubtful cases would be ideal if it could be accomplished without too great interference with his work. Intimate, personal, contact of intern and resident with the parents is of the greatest pedagogic value to the former, and a great source of comfort and assurance to the latter. Parenthetically, it is a genuinely sympathetic interest in both patient and parent, and an unwavering effort to do all that can be done during an illness that is the biggest factor in the procuring of autopsies.

One thing more. I have before referred to the necessity for some degree of flexibility in the conduct of a hospital. Routine is essential in the orderly conduct of any institution, and rules are formulated to maintain that orderly routine. But as in all other institutions, or even more so, in the hospital rules and routine cannot at all times abrogate individual cerebration. It is largely the rule, the unyielding routine, that makes for the patient the fundamental difference between the human and the institutional heart. It is hard for a mother to grasp the necessity for a rule or a time-consuming routine when gripped by anxiety, when cutting of the Gordian knot would seem to her so clearly indicated. There are occasions when rule and routine should be smashed into unrecognizable fragments. If this is not possible, or expedient, in a given case, then pains should be taken, carefully and, if possible, convincingly, to explain the necessity for such routine as a measure for the greatest good of the greatest number.

There is a temptation to dwell on this matter of routine. I shall content myself with speaking of a single routine procedure that I understand is still followed in many if not indeed most hospitals, even children's hospitals. I wonder how many of us pediatricians know that our patients are wakened at 6 in the morning to have their faces and hands washed, their hair combed, and their toilet necessities attended to so that they may be ready for breakfast by 7:30. This deconventionalizing and untherapeutic procedure may seem necessary from the standpoint of the division of work between night and day nurse, but to a physician who believes that rest and undisturbed sleep are the most powerful weapons in our therapeutic armamentarium it doesn't seem just right.

A lack of flexibility, finally, is in evidence in another direction. In any large community there are many who are poor, many who are well-to-do. There is a large intermediate class who are neither rich nor poor. The rich and the poor are well provided for in private rooms and open wards, respectively. The man who today needs our greatest sympathy, with the greatly increased cost of hospitalization, is the man, especially the white-collared man, who neither will, nor may, accept charity or near charity, and yet who cannot meet without unwarranted sacrifice the expense of even the cheapest room or private ward, plus incidentals and a doctor's fee, in any prolonged illness. Once classified as a private patient there are many things for which he must pay the same fixed price as the richest patient. We furnish special nurses free for the indigent if necessary, but this man must pay $50 or $60 a week extra for a special nurse or his child must go without. We have here again a difference between the human and the institutional heart. Many a man of this class pays his hospital bills without mitigation while the doctor charges little or nothing so that the patient may have the benefit of hospital care. A more freely sliding scale based on ability to pay such as physicians frankly employ, many more times down for poverty than up for wealth, is not as simple and workable for a hospital as it is for the physician, who has a personal interest in the patient and a personal knowledge of the financial sacrifices entailed. Much has been done, more is left to do, to reach that ideal which assures to rich and poor, and to those in between, the same adequate care without undue financial or personal embarrassment to any one class. After all, we are not selling groceries; our stakes are human lives.

In conclusion, I would like to leave as a sort of benediction another quotation from the address of Dr. Abt's which I have already mentioned: "A children's hospital is a sanctuary consecrated to the healing of the sick and dedicated to the training of men and women in the art of medicine. Its staff should have a keen sympathy and a genuine love for the work and for the human souls who occupy the sick beds."

707 Fullerton Avenue.

Medicolegal

Waiver of Jury Trial by Insane Defendant

(State v. Smith (Ohio), 174 N. E. 768)

Smith was indicted by the grand jury of Ashtabula County, Ohio, for murder in the first degree. He pleaded not guilty by reason of insanity. Later, availing himself of a provision in the Ohio statutes, he waived his right to a trial by jury and elected to be tried by the judge. The court, however, refused to accept the waiver, the case was tried by a jury, and the defendant was found guilty and sentenced to be electrocuted. The Court of Appeals reversed the conviction and remanded the case for a new trial, and thereupon the state appealed to the Supreme Court of Ohio.

It was urged by the state that if the defendant was insane he could not waive a jury trial, and that the court rightly refused to permit him to do so, because if he was insane, or unable to appreciate the consequences of such a waiver, the waiver itself would be void. But granting this, said the Supreme Court, if he was so insane as to be unable to appreciate the possible consequences of his waiver, then it followed as a matter of course that he should not have been placed on trial; if he was incapable of waiving a jury trial, he was likewise incapable of making his plea, or of being a witness, or of assist-

ing his counsel in the conduct of a case on the result of which his life depended.

The General Code of Ohio, section 13442-5, provides:

> In any case where a defendant waives his right to trial by jury and elects to be tried by the judge of such court as provided in the next preceding section, any judge of the court in which such cause is pending shall have jurisdiction to proceed with the trial of said cause, and shall proceed to hear, try and determine such cause in accordance with the rules and in like manner as if such cause were being tried before a jury.

The preceding section of the General Code, to which reference is made, provides that the defendant shall have the right to waive a trial by jury and may, if he so elects, be tried by the court without a jury. These sections are mandatory and do not confer power on the court to reject the waiver, unless suggestion of present insanity is made by counsel for the accused or notice of such insanity comes otherwise to the court. If it be suggested by counsel for the accused, or it otherwise comes to the notice of the court, that the accused is not then sane, the court or jury must determine that issue under section 13441-1 of the General Code of Ohio, before the accused is placed on trial for the offense of which he is charged. If insanity exists, such an inquiry should, if possible, take place before completing the costly and intricate proceedings of a criminal trial. If the trial court regarded the representations of counsel for the accused as a suggestion or notice of present insanity, the course of the court was charted by the provisions of the code just stated. If the court did not regard such representations as amounting to a suggestion or notice of insanity, the course of the court was indicated by the provisions of the code giving the accused the right to waive a jury trial. Viewed in either aspect, the trial court committed an error. The judgment of the court of appeals, Ashtabula County, reversing the conviction and remanding the case for a new trial was affirmed.

Eugenic Sterilization Statute Valid

(Clayton v. Board of Examiners of Defectives (Neb.), 234 N. W. 630)

Clayton, about 22 years old, was an inmate of the Nebraska institution for the feebleminded. The state board of examiners of defectives found that, while he appeared to be physically normal, his mentality was such that he could not progress beyond the third grade in school and that his "intelligence quotient" was only 40 per cent. He was rated as a high grade imbecile. Clayton had two brothers and two sisters, one brother and one sister being inmates with him of the institution for the feebleminded. The examining physicians, who comprised the board of examiners of defectives, concluded that Clayton's feeblemindedness was congenital and that his offspring, if any, would inherit about the same degree of mentality that he possessed.

The law of Nebraska provides:

> It shall be the duty of the board of examiners to examine into the innate traits, the mental and physical conditions, personal records and the family traits and histories of these inmates (of the institutions for the feebleminded, the hospitals for the insane and other named institutions), and if after a careful examination and investigation, such board of examiners find that such inmate is feebleminded or insane or is an habitual criminal, moral degenerate or sexual pervert, that such inmate is capable of bearing or begetting offspring, that children born or begotten by such inmate would inherit a tendency to feeblemindedness, insanity, degeneracy or criminality, that such children would probably become a social menace and that procreation by such inmate would be harmful to society and that such inmate should not be paroled or discharged, as the case may be, unless sterilized, then in every such case it shall be a condition prerequisite to the parole or discharge of such inmate, that said inmate be made sterile, and that such operation be performed for the prevention of procreation as in the judgment of said board of examiners would be most appropriate to each individual case.

Under authority of the statute, the board of examiners ordered that Clayton be sterilized. Clayton appealed to the district court, attacking the constitutionality of the statute. The district court, however, affirmed the order of the board, and affirmed, too, the constitutionality of the statute so far as it related to the sterilization of feebleminded persons such as the petitioner, construing the act, however, to limit sterilization to vasectomy or salpingectomy. By implication, so much of the statute as calls for the castration of male inmates convicted of rape, incest, or crimes against nature was believed by the court to be unconstitutional. Clayton thereupon appealed to the Supreme Court of Nebraska.

The Supreme Court quoted with approval the decision of the Supreme Court of Virginia in *Buck* v. *Bell*, 143 Va. 310, 130 S. E. 516, 519, affirmed by the U. S. Supreme Court, 274 U. S. 200, 47 Sup. Ct. 584, with respect to a similar statute, as follows:

> The act is not a penal statute. The purpose of the Legislature was not to punish but to protect the class of socially inadequate citizens named therein from themselves, and to promote the welfare of society by mitigating race degeneracy and raising the average standard of intelligence of the people of the state.

The court quoted also, with approval, *State* v. *Feilen*, 70 Wash. 65, 126 P. 75, holding that, in the case of one convicted of rape, vasectomy is not a cruel punishment. The Supreme Court of Nebraska was of the opinion that vasectomy, as applied to a feebleminded person, does not come within the constitutional inhibition against cruel and unusual punishment and concluded:

> The legislative act before us is in the interest of the public welfare in that its prime object is to prevent the procreation of mentally and physically abnormal human beings. We think it is within the police power of the state to provide for the sterilization of feebleminded persons as a condition prerequisite to release from a state institution.

The judgment of the district court affirming the order of the board of examiners of defectives was affirmed.

Workmen's Compensation Acts: Perforation of Duodenal Ulcer Following Strain.—The employee, September 9, suffered severe pain from lifting a heavy ore car. He continued work until September 11, when he attempted to pull a bell rope and collapsed. He was assisted to his home, and the following day removed to a hospital. Subsequently he was taken to another hospital, where he died, September 15. An autopsy established the cause of death as peritonitis following a perforation of a duodenal ulcer. The autopsy showed, too, several other duodenal ulcers partially healed. The sole question was whether the admitted cause of death, the perforation of the ulcer, was a result of muscular exertion in the course of employment. That the perforation of the ulcer, said the Supreme Court of California, was the cause of death was not doubted. Whether this perforation occurred as a result of muscular strain or wholly apart from the employee's occupation was purely a matter of expert opinion. No direct evidence on this point was available. The evidence before the industrial accident commission permitted the inference that the rupture was the normal result of the continuous process of ulceration. The commission weighed the various opinions and concluded that the evidence failed to establish that the death was caused or accelerated by injury arising out of and in the course of employment. On this record, concluded the Supreme Court of California, the conclusion of the industrial accident commission must be accepted.—*Brandon v. Industrial Accident Commission (Calif.), 294 P. 1064.*

Society Proceedings

COMING MEETINGS

American Society of Tropical Medicine, New Orleans, November 18-20. Dr. Benjamin Schwartz, P. O. Box 131, Pennsylvania Avenue Station, Washington, D. C., Secretary.

Association of American Medical Colleges, New Orleans, November 30-December 2. Dr. Fred C. Zapffe, 25 East Washington Street, Chicago, Secretary.

Association of Military Surgeons of the United States, New Orleans, November 30-December 2. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Central Society for Clinical Research, Chicago, November 20. Dr. Lawrence D. Thompson, 903 University Club Building, St. Louis, Secretary.

Philippine Islands Medical Association, Manila, December 15-18. Dr. A. S. Fernando, 817 Taft Avenue, Manila, Secretary.

Radiological Society of North America, St. Louis, November 30-December 4. Dr. I. S. Trostler, 25 East Washington Street, Chicago, Secretary.

Society of American Bacteriologists, Baltimore, December 28-31. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Medical Association, New Orleans, November 18-20. Mr. C. P. Loranz, Empire Building, Birmingham, Alabama, Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., December 8-11. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Denver, December 4-5. Dr. Frank R. Teachenor, 306 East Twelfth Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

1: 355-428 (Sept.) 1931

Principles of Vaccine Therapy. J. A. Kolmer, Philadelphia.—p. 355.
Consideration of Theoretical Bases for Vaccine Therapy. N. W. Larkum, Lansing, Mich.—p. 365.
Use of Stock Vaccines as Nonspecific Treatment of Respiratory Infections in Children. R. P. Forbes, Denver.—p. 373.
Aschheim-Zondek Pregnancy Test: Its Clinical Application in a Series of Cases. R. H. Jones and E. R. Mugrage, Denver.—p. 379.
Recurrent Agranulocytosis: Unusual Case. R. R. Kracke, Decatur, Ga.—p. 385.
Standard Normals and Normal Ranges in Hematology. F. Boerner, Philadelphia.—p. 391.
New Modification of Mallory-Heidenhain's Differential Staining Method and Adaptation of Formalin-Fixed Material for Mallory's Stains. J. W. Kernohan, Rochester, Minn.—p. 399.

American Journal of Diseases of Children, Chicago

42: 503-734 (Sept.) 1931

*Early Diagnosis of Rheumatic Heart Disease in Children. M. Seham, M. J. Shapiro and Eunice H. Hilbert, Minneapolis.—p. 503.
*Encephalography in Children. M. Bogin, T. G. Holzsager and B. Kramer, Brooklyn.—p. 527.
Meckel's Diverticulum: Pathologic Study of Sixty-Three Cases. A. Christie, New York.—p. 544.
*Electrocardiographic Studies in Infectious Diseases: II. Scarlet Fever. C. Shookhoff and L. M. Taran, Brooklyn.—p. 554.
*Human Milk Studies: VII. Chemical Analysis of Milk Representative of Entire First and Last Halves of Nursing Period. Icie G. Macy, Betty Nims, Minerva Brown and Helen A. Hunscher, Detroit.—p. 569.

Rheumatic Heart Disease.—Seham and his associates state that in 809 children admitted to a heart clinic during a period of seven years, 46 per cent of the cases were diagnosed as organic heart disease and 54 per cent as "no heart disease." Of 379 cases of organic heart disease, 18 per cent were congenital lesions of the heart, 74 per cent were rheumatic in origin, only 3.6 per cent were due to other causes and 4.4 per cent were undiagnosed. For early diagnosis of rheumatic heart disease, all available methods are necessary; namely, (1) etiologic, (2) structural, (3) functional, (4) roentgenologic and esophagraphic and (5) electrocardiographic. The problem of differential diagnosis revolves chiefly around the children who present the following conditions: (1) a systolic murmur, with or without circulatory signs and symptoms, (2) rheumatism and a systolic murmur that has escaped carditis, (3) rheumatism and a systolic murmur that ultimately develops into chronic endocarditis and (4) congenital heart disease, especially patency. According to the author's statistics, the most reliable means of diagnosis is the history. A questionnaire gives more positive data than informal questioning. In 92 per cent of the cases of early mitral disease it was possible to obtain a history of rheumatism. Rheumatism alone causes 39.3 per cent of rheumatic heart disease; rheumatism in combination with other causes, 83.1 per cent. Growing pains alone are responsible for 2.3 per cent. In the first contact, 42 per cent of the cases diagnosed as "early mitral disease" show abnormalities revealed by the roentgenograms; in the cases called "all others," 84 per cent were abnormal. The roentgenogram taken at a distance of 6 feet is as reliable for the practical purposes of diagnosis in children as the orthodiagram. The 50 per cent cardiothoracic index that is used as a normal standard is statistically not highly reliable. In 66 per cent of normal children the cardiothoracic index is between 44 and 50 per cent, and the remaining 33 per cent fall between 41 and 54 per cent. In 25 of 100 consecutive examinations of normal children, one is likely to find a cardiothoracic index of over 50 per cent. A positive esophagram reveals a dilatation of the left auricle. This does not appear in children with congenital heart disease, in those with miscellaneous heart disease or in normal children. The esophagraphic results are positive in 55 per cent in cases diagnosed as mitral regurgitation. In this group the esophagram is more sensitive than auscultation. It gives positive observations in 67 per cent in the group diagnosed as double mitral disease and 77 per cent in those with double mitral disease and aortic regurgitation. The absent iso-electric period in lead II and the delayed P-R interval are indications of active rheumatic infection. The former does not occur when there has been no rheumatism. The so-called functional heart tests are of no value in determining the myocardial sufficiency of the heart. The functional method of diagnosis by the taking of the patient's history is probably the least sensitive of all methods for a diagnosis in the early stages.

Encephalography.—According to Bogin and his associates, the accumulated experience of ten years with encephalography has served to evaluate its clinical significance. Their observations on twenty cases of encephalography in children are presented. Although encephalography is not without its contraindications and dangers, the procedure has proved to be of definite value in the differential diagnosis of many intracranial conditions and the exact localization of some of these. In this way it has been helpful to surgeons contemplating operative intervention. In that it can reveal gross anatomic lesions, it is of distinct value to pediatricians and neurologists, especially in their consideration of prognosis. Therapeutic applicability has been demonstrated in some neurologic disorders.

Infectious Diseases.—Fifty patients with scarlet fever admitted consecutively were studied electrocardiographically by Shookhoff and Taran. The cardiac rate did not differ from that in normal children in the same age group. In children with fever the increase in rate was commensurate with the increase in temperature. A relative bradycardia, beginning in the second week and returning to normal at the end of the third week, was observed in 25 per cent of the cases. Sinus arrhythmia occurred just as frequently as it did in normal children. No prolongations of the P-R interval were observed. Only minor changes in the T or R-T waves were noted in 10 per cent of the children. These changes returned to normal before the patient was discharged. An abnormal axial deviation occurring during the course of the illness was noticed in 16 per cent of the children. The deviation of the axis returned to normal limits before discharge in all but one child. These observations differ from those described in rheumatic fever in (*a*) the comparative infrequency of electrocardiographic evidence of myocardial involvement; (*b*) the absence of any tendency for abnormalities, when present, to persist, and (*c*) the absence of prolongation of the P-R interval.

Human Milk Studies.—Macy and her associates call attention to the fact that renewed interest has been focused on the chemistry of breast milk as it relates to the nutritional well being of the baby at the breast. Under standardized methods of collection and analysis, gross chemical changes in breast milk representative of the first and last halves of nursing have been observed. These changes were not influenced by the presence and condition of the baby at the breast. They are indicative of nutritional and clinical significance. During the progression of nursing, the fat, protein, casein-nitrogen, total solids and phosphorus tend to increase. Definite ratios between various constituents in the milk are of importance. These ratios, with the progression of nursing, may approach abnormal values in some cases. Furthermore, the inconstancy of ratios between certain constituents lends support to the indications that certain components are controlled by different secretory mechanisms.

American Journal of Orthopsychiatry, Menasha, Wis.

1: 451-558 (Oct.) 1931

Possible Endocrine Factor in Behavior Problems of the Young. A. W. Rowe, Boston.—p. 451.
Changing Goals of Psychiatric Social Work. Christine C. Robb, New York.—p. 476.
Attitudes of Prison Inmates. H. E. Field, Boston.—p. 487.
Rorschach Test in Problem Children. S. J. Beck, Boston.—p. 501.
The Neurotic Character as New Psychoanalytic Concept. L. H. Bartemeier, Detroit.—p. 512.
Orthopsychiatry and Statistics. C. Rosenow, New York.—p. 521.
Results of Sims Socio-Economic Rating Scale When Given to Delinquent and Nondelinquent Juveniles. C. Thomas, Detroit.—p. 527.

American Journal of Physical Therapy, Chicago

8: 181-204 (Oct.) 1931

Practical Application and Usage of Quartz Ultraviolet Radiation. E. W. Erickson, Chicago.—p. 181.
Preparation of the Patient. A. T. Noe, Santa Barbara, Calif.—p. 185.

American Journal of Public Health, New York

21: 1091-1188 (Oct.) 1931

Training for the Public Health Engineer. S. C. Prescott, Cambridge, Mass.—p. 1091.
Training of Health Department Personnel. J. A. Ferrell, New York.—p. 1099.
Sanitary Control of Shellfish in State of Washington. H. W. Nightingale, Seattle.—p. 1107.
Western State Boards of Health. P. W. Covington, Salt Lake City, Utah.—p. 1112.
Studies on Self-Disinfecting Power of Skin. J. F. Norton and Marguerite F. Novy, Detroit.—p. 1117.
Report on Thirty-One Strains of B. Dysenteriae Sonne Isolated During Epidemic in Rochester. Alice D. Leahy, Rochester.—p. 1126.
Wassermann Reactions in College Students. H. S. Diehl, Minneapolis.—p. 1131.

Archives of Neurology and Psychiatry, Chicago

26: 687-904 (Oct.) 1931

Raynaud's Disease: Evidence That It Is a Type of Vasomotor Neurosis. S. L. Simpson, G. E. Brown and A. W. Adson, Rochester, Minn.—p. 687.
Cerebral Circulation: XIV. Respiratory Quotient of Brain and of Extremities in Man. W. G. Lennox, Boston.—p. 719.
Id.: XV. Effect of Mental Work. W. G. Lennox, Boston.—p. 725.
Id.: XVI. Changes in Human Retinal Circulation and in Pressure of Cerebrospinal Fluid During Inhalation of Mixture of Carbon Dioxide and Oxygen. S. Cobb and F. Fremont-Smith, Boston.—p. 731.
Id.: XVII. Cerebral Blood Flow and Vasomotor Response of Minute Vessels of Human Brain to Histamine. Soma Weiss and W. G. Lennox, Boston.—p. 737.
Classification of Gliomas and Neuroglia Cell Types. W. Penfield, Montreal.—p. 745.
Neuro-Anatomy in Respiratory Failure: Two Cases. K. H. Finley, New Haven, Conn.—p. 754.
Grasping Reflex in New-Born Monkey. C. P. Richter, Baltimore.—p. 784.
Neurons of Sensory Type in Ventral Roots of Man and of Other Mammals. W. F. Windle, Chicago.—p. 791.
Anatomic Variations of Cranial Venous Sinuses: Their Relation to Effect of Jugular Compression in Lumbar Manometric Tests. E. A. Edwards, Boston.—p. 801.
Schizophrenic Psychoses: Critical Considerations of Psychoanalytic Treatment. F. Alexander, Chicago.—p. 815.
Blood-Cerebrospinal Fluid Barrier in Manic-Depressive Psychosis: Ratios of Distribution of Bromide, Calcium, Sugar and Chlorides. D. Rothschild, Foxboro, Mass., and W. Malamud, Iowa City.—p. 829.

Canadian Medical Association Journal, Montreal

25: 385-518 (Oct.) 1931

Health Insurance. H. McPhedran, Toronto.—p. 385.
*Study of Enzymes of Stools in Intestinal Intoxication. F. G. Banting, S. Gairns, J. M. Lang and J. R. Ross, Toronto.—p. 393.
Effect of Peritoneal Adhesions on Urinary Tract. F. S. Patch and M. D. Evans, Montreal.—p. 399.
Intrathoracic Neoplasms. A. A. Rowan, Ste. Anne de Bellevue, Que.—p. 401.
*Three Years' Experience with Vaccination Against Common Cold. R. V. Ward, Montreal.—p. 408.
*Vitamin A and Common Cold. H. P. Wright, J. B. Frosst, F. Puchel and Margaret R. Lawrence, Montreal.—p. 412.
*Notes on New Cases of B. Dysenteriae Sonne Infection. Marion M. Johnston and A. Brown, Toronto.—p. 417.
Some Clinical Aspects of Disproportion in Obstetrics. L. C. Conn, Edmonton.—p. 419.
*Focal Infection. D. Graham, Toronto.—p. 422.
*Heart Conditions Simulating Acute Abdominal Symptoms. G. R. Burns, Halifax.—p. 424.
*The Prostatic Problem. J. H. Cunningham, Boston.—p. 428.
Vaccine Treatment of Chronic Arthritis. A. E. Vipond, Montreal.—p. 432.
Common Factors Influencing Surgical Mortality. J. D. McEchern, Winnipeg.—p. 435.
Case of Thrombo-Angiitis Obliterans Treated by Bilateral Lumbar Sympathetic Ganglionectomy. E. H. Wood, Peterborough.—p. 438.
Chronic Nasopharyngitis and Chronic Bronchial Infection. W. W. Priddle, Toronto.—p. 441.
Exploration of Abdomen by Roentgen Rays. C. W. Prowd, Vancouver.—p. 444.

Intestinal Intoxication.—Banting and his associates found that after digestion was established in a normal infant the stools contained large amounts of trypsin, amylase and lipase. The trypsin content of the stools of infants suffering from intestinal intoxication was decreased in proportion to the severity of the case. In very young infants the curves were lower than in older children. When the case of intestinal intoxication was complicated by bronchopneumonia, mastoid or other focal infections, the clinical condition became worse, usually without a corresponding decrease of trypsin. The low trypsin content was not a terminal condition, since the stools of children dying of other diseases had a normal trypsin content until death. The lipase and amylase content of the stools did not correspond exactly to the trypsin content. In general, a low trypsin content was always accompanied by a low amylase and lipase content, but with a high trypsin the amylase and lipase might be either high or low. Of the three enzymes studied, trypsin seemed to give the best indication as to the severity of the disease. The original hypothesis was that the serum in the lumen of the bowel inhibited the action of trypsin, thus causing intestinal intoxication. However, it was shown that in this disease there is also a decrease in the amylase and lipase of the stool, and since the action of these enzymes is not inhibited by raw serum, the original theory is untenable. The inference is that in intestinal intoxication the pancreas fails to produce its normal quantity of enzymes. At the present time it is impossible to state whether this is a cause or an effect of the disease.

The Common Cold.—After preliminary trials Ward gave a large group of Montreal factory employees inoculations over a period of two years with stock vaccines designed to prevent the occurrence of acute respiratory disorders. Care was taken to select those people who had had a bad record of trouble from these disorders. Over a period of four months careful records were kept of the time these people lost from pneumonia, bronchitis, influenza, colds and tonsillitis, and their record was compared with that of a control group consisting of all the other employees in the factory. In 1929-1931, although there were fewer absences among the vaccinated group, the number of days lost per hundred in this group was slightly greater than in the control group. A few irritating but no serious reactions or results occurred. Most of those inoculated seemed to feel that they had been benefited. The author believes it is perfectly clear that the stock vaccines used cannot in any sense be considered a sure and specific preventive of acute respiratory disorders in the dosage used. That they do benefit a large percentage of people is apparent from the fact that the absenteeism of a group of people who are habitual sufferers from respiratory troubles can be reduced to a point below that of a control group. There are apparently a good many individuals on whom the vaccine has no effect whatever.

Vitamin A and Common Cold.—Wright and his associates supplied twenty infants over a period of months with large amounts of vitamin A. Forty infants under exactly similar circumstances were supplied with the amount of vitamin A usually given to normal infants. No appreciable difference was found in the incidence to infection of the upper respiratory tract in the two groups. Therefore, it is concluded that vitamin A in excessive amounts does not protect infants against respiratory infection.

B. Dysenteriae Sonne Infection.—Twenty strains of B. dysenteriae Sonne were isolated by Johnston and Brown from the stools of 175 infants and children who were admitted to a hospital for sick children during a period from October, 1928, to June, 1930. The symptoms presented by these children were usually diagnosed clinically as acute intestinal intoxication, infectious or fermentative diarrhea, or dysentery. In addition, two strains were obtained from infants with pyelitis. The clinical data relative to the patients from whom these strains were cultivated and the biologic and serologic reactions of the strains have been reported. The authors present in brief form relevant data regarding the source of thirty additional strains isolated since June, 1930, together with certain facts concerning the clinical manifestations occasioned by infection with B. dysenteriae Sonne. B. dysenteriae Sonne appears to be the etiologic factor in gastro-intestinal disturbances during the epidemic diarrhea season as well as during colder months of the year. Infections were especially numerous and serious among infants under 2 years of age; they also occurred in children over that age limit, and in adults. The infant cases were severe with sudden onset or were mild when the infection

commenced but became more serious as the result of prolonged diarrhea and vomiting and consequent dehydration and toxemia. Children over 2 years of age experienced an acute onset of symptoms which usually terminated in a comparatively short period of time. Uniformity of clinical symptoms presented by infants did not hold for children more than 2 years of age, as diarrhea or vomiting were entirely wanting and pain or convulsions or fever were the most important early clinical manifestations. That this bacillus was probably the cause of infections which produced a higher mortality among infants under 2 years of age is shown by the fact that three children in that age group died, while all children over 2 years of age recovered.

Focal Infection.—Graham makes a plea for a fuller appreciation of the causal relationship of focal infection to chronic disease conditions, a more complete treatment of patients, greater attention to the study of the after-effects of treatment, and a closer cooperation between physician and specialist, that patients may receive the maximum benefit from the removal of foci of infection.

Heart Conditions Simulating Acute Abdominal Symptoms.—Burns calls attention to the fact that at times common cardiac conditions may closely simulate acute conditions in the abdomen, leading to unnecessary operation and consequent death of the patient. The conditions he mentions practically all have more or less pronounced features, in particular cases, fever, leukocytosis, abdominal pain, muscular spasm, shock, as well as minor symptoms, such as vomiting, diarrhea, nausea and belching of gas, rendering the clinical picture much the same. The second point he makes is that a careful history and a careful examination of the cardiovascular system are of the utmost importance.

The Prostatic Problem.—Cunningham believes that the pathologic events dependent on prostatic obstruction are primarily mechanical in origin, and, secondarily, are due to infection; that back pressure in the kidneys with impairment of their function and the consequent cardiorenal complex, with toxemia, is the most important and dangerous feature of the malady; that it is this impairment of kidney function, with the resulting cardiac embarrassment and toxemia, that is the common cause of death in the prostatic patient. He emphasizes the fact that bladder drainage, whereby urinary back pressure is relieved and infection lessened, cardiac and renal stimulation and saturating the body with water will result in a varying degree of kidney, and consequently general, improvement; that there are certain special tests that should be employed to estimate the physical status, both general and local; and that it is unjustifiable to subject an individual to any operative procedure except suprapubic drainage, to relieve retention, without first gaining the important knowledge and physical improvement that may be attained by preoperative study and treatment. Such investigations determine the patient fit or unfit for radical surgical relief, and it is not the condition of the prostate so much as the condition of the kidneys and circulation, as well as the patient's general condition, in other respects, which determines this point. In regard to the operative treatment, no one operation is suitable for all patients, and the choice of operation depends on two features: the patient's general physical condition, and the character of the obstruction.

Delaware State Medical Journal, Wilmington

3: 157-177 (Sept.) 1931

Goldstein's Heredofamilial Angiomatosis (Telangiectasia) with Recurring Familial Hemorrhages (Rendu-Osler-Weber's Disease): Case Reports. H. I. Goldstein, Camden, N. J.—p. 161.

Florida Medical Association Journal, Jacksonville

18: 113-150 (Sept.) 1931

Some Observations on Appendicitis. J. S. McEwan, Orlando.—p. 113.
Head Injuries. H. D. Van Schaick, Jacksonville.—p. 118.
Ocular Disturbance in Pregnancy and During Puerperium. N. M. Black, Miami.—p. 121.
Unusual Ulcerative Condition of Chest Wall. Diagnosis: Tuberculous Gummas. J. L. Kirby-Smith, Jacksonville.—p. 125.
Some Problems in Urologic Diagnosis. W. H. Toulson, Baltimore.—p. 131.

Georgia Medical Association Journal, Atlanta

20: 374-414 (Oct.) 1931

Roentgen Radiation as Aid in Treatment of Menopausal Disturbances. J. J. Clark, Atlanta.—p. 376.
Diseases of Chest. C. C. Aven, Atlanta.—p. 379.
Clinical Use and Value of Electrocardiograph. H. C. Sauls and C. Smith, Atlanta.—p. 381.
Dermatology. H. Hailey, Atlanta.—p. 386.
Results of Surgery in Treatment of Tuberculosis of Lung. F. K. Boland, Atlanta.—p. 388.
Clinical Value of Schilling Blood Count. R. R. Kracke, Emory University.—p. 392.
Cancer: Chapter V. J. L. Campbell, Atlanta.—p. 399.

Iowa State Medical Society Journal, Des Moines

21: 477-532 (Sept.) 1931

Indications for Simple Mastoid Operation. G. W. MacKenzie, Philadelphia.—p. 477.
Honesty in Medicine. B. G. Budge, Ames.—p. 482.
Neurasthenia. A. H. Woods, Iowa City.—p. 485.
Psychotherapy of Neurasthenia: Especial Emphasis on Psychoanalytic Method. W. Malamud, Iowa City.—p. 489.
Rheumatic Heart Disease. D. H. Kelly, Des Moines.—p. 495.
Methods of Diagnosis. E. Grimes, Des Moines.—p. 500.
Hydronephrosis. H. F. Dolan, Anamosa.—p. 506.

Journal of Biological Chemistry, Baltimore

93: 1-226 (Sept.) 1931. Partial Index

Effect of Ultraviolet Irradiation on Free Sterols of Lanolin. A. Bernhard and I. J. Drekter, New York.—p. 1.
*Equilibrium Between Cerebrospinal Fluid and Blood Plasma: VI. Distribution of Sodium Between Cerebrospinal Fluid and Blood Serum. Mary Elizabeth Dailey, Boston.—p. 5.
Influence of Growth on a Number of Constituents of White Rat. A. Chanutin, University, Va.—p. 31.
*Hemoglobin Production: III. Relief of Anemia, Due to Milk Diet, by Feeding Amino-Acids and Related Compounds. D. L. Drabkin and H. K. Miller, Philadelphia.—p. 39.
*Rôle of Copper in Hemoglobin Regeneration and in Reproduction. H. L. Keil and V. E. Nelson, Ames, Iowa.—p. 49.
*Origin of Glucose Liberated by Epinephrine in Depancreatized Animals. J. L. Bollman, F. C. Mann and C. M. Wilhelmj, Rochester, Minn.—p. 83.
Calcium Content of Body in Relation to That of Food. H. C. Sherman and L. E. Booher, New York.—p. 93.
Further Observations on Relation of Calcium and Phosphorus Intake to Hypercalcemia and Hyperphosphatemia Induced by Irradiated Ergosterol. J. H. Jones and M. Rapoport, Philadelphia.—p. 153.
*Relation of Glycogen to Water Storage in Liver. E. M. Bridge and E. M. Bridges, Baltimore.—p. 181.
Improved Technic for Production of Nutritional Anemia in Rats. C. A. Elvehjem and A. R. Kemmerer, Madison.—p. 189.
Ineffectiveness of Purified Glutamic Acid as Supplement to Iron in Correction of Nutritional Anemia. C. A. Elvehjem, H. Steenbock and E. B. Hart, Madison, Wis.—p. 197.
Determination of Calcium by Alkalimetric Titration: II. Precipitation of Calcium in Presence of Magnesium, Phosphate and Sulphate, with Applications to Analysis of Urine. C. H. Fiske and M. A. Logan, Boston.—p. 211.

Cerebrospinal Fluid and Blood Plasma.—Dailey presents data on sodium and chloride values in human serum and cerebrospinal fluid in ninety-seven instances. She noted that the serum sodium value tends to vary directly with the serum chloride. The spinal fluid sodium is, in most instances, slightly higher than that of serum. In meningitis the average values for sodium in both serum and cerebrospinal fluid are slightly lower than in the normal group. The lowest values tend to be associated with low chloride values, although the sodium diminution in serum and cerebrospinal fluid is usually less marked than the diminution in chloride. Acute changes in the sodium and chloride content of serum by blood dilution are reflected in the spinal fluid, and the change in sodium is proportional to the chloride change. The average ratio of serum chloride to spinal fluid chloride is 0.82.

Amino-Acids in Milk Anemia.—Drabkin and Miller describe experiments which indicate that, while succinic acid and succinimide are somewhat effective in the relief of milk anemia, leucine, cystine, glycine, α-amino valeric acid, and glutaric acid are ineffective. Rats have been found to become anemic as readily on boiled as on raw milk. The onset of anemia has been retarded by the administration of an iron salt at a low level which was ineffective in curing the anemia once produced. Rats receiving milk supplemented with sodium glutamate appeared definitely more resistant to anemia, even in the absence of iron administration, than rats that were fed iron alone or on iron and alanine. The results of a third

group of experiments in which the quantity of glutamic acid and iron needed for the relief of milk anemia has been studied have been reported and discussed.

Rôle of Copper in Hemoglobin Regeneration.—According to Keil and Nelson, nutritional anemia is readily produced in rats on a whole milk diet. Pure iron as ferric chloride when added to milk collected in glass does not cause regeneration of hemoglobin. Salts of vanadium, titanium, manganese, nickel, arsenic, germanium, zinc, chromium, cobalt, tin and mercury also failed to stimulate regeneration of hemoglobin when added to milk, collected in glass, and supplemented with pure iron as ferric chloride. Copper was the only element tested which had a positive effect on hemoglobin building. Reproduction was obtained on milk and iron as ferric chloride by the sole addition of copper sulphate.

Dextrose Liberated by Epinephrine.—Bollman and his associates maintained depancreatized animals in good condition by large doses of insulin and appropriate feeding. Four days after the withdrawal of insulin, epinephrine increased the glycosuria beyond that which could be accounted for by the conversion of protein dextrose. At the end of a twelve hour period of administration of epinephrine there was little change in the glycogen or dextrose content of the liver. The dextrose content of the blood and muscles was not materially altered. There was a marked decrease in the glycogen content of the muscles, which in these experiments was reduced to very low values (from 20 to 30 mg. for each 100 Gm. of muscle). The dextrose found in excess of the ratio between the dextrose and the nitrogen of 2.8 was almost identical in amount with the loss of glycogen from the muscle. Evidence of formation of dextrose from other substances (fat) was not obtained.

Water Storage in Liver.—Bridge and Bridges made the glycogen content of the liver of rabbits vary by modifications of the diet. Alterations in the percentage of glycogen in the liver were found to be offset by changes in one or more of the other components, especially proteins. Per unit of animal weight the total glycogen and water of the liver bore no relationship to each other. The observations do not substantiate the frequently quoted statement that, with every gram of glycogen, 3 Gm. of water is also stored in the body. In explanation of the shifts in body water which result from changes in the proportion of fat and carbohydrate in the diet, it is suggested that the mechanism is more likely to be found in the metabolism of fats than of carbohydrates.

Journal of Infectious Diseases, Chicago

49: 183-269 (Sept.) 1931

*Certain Monilias Parasitic on Man: Their Identification by Morphology and by Agglutination. Rhoda W. Benham, New York.—p. 183.
*Specificity of Avian Tuberculin Reactions. Vera B. Dolgopol, New York.—p. 216.
*Influence of Pus and Blood on Action of Bacteriophage. Martha Applebaum and W. J. MacNeal, New York.—p. 225.
Infection of Accessory Sinuses and Upper Respiratory Tract in Avitaminosis of Rats. R. G. Turner and E. R. Loew, Detroit.—p. 244.
Effect of Bacteriophage on Experimental Anthrax in White Mice. P. B. Cowles and W. M. Hale, New Haven, Conn.—p. 264.

Monilias Parasitic on Man.—According to Benham, the parasite found in thrush (Monilia albicans) is a well defined species which can be recognized and differentiated from related forms by its morphologic and cultural characteristics. M. psilosis of Ashford is aparently identical with M. albicans isolated from thrush. Many of the yeastlike organisms found in erosio interdigitalis, in chronic paronychias, in perlèche, in other dermatoses and in certain types of superficial glossitis should for the present be placed in this species. Other species showing slight, but definite, morphologic differences are found on the skin and in the sputum and feces. The author tested thirty strains of monilias for virulence. Nineteen, identified as M. albicans, from various sources, were pathogenic for rabbits. Eleven strains of other types did not produce any lesions. Seven strains of M. albicans proved similar in antigenic content as determined by reciprocal absorption of agglutinins. The slight differences detected could not be correlated with the sources from which these strains were obtained. Agglutinative reactions, when used in conjunction with other methods, were found the most satisfactory means for the identification of these rudimentary forms.

Avian Tuberculin Reactions.—Dolgopol states that a positive reaction to avian tuberculin, observed in many cases of pulmonary tuberculosis, does not indicate an active mixed infection with human and avian tubercle bacilli. (This conclusion is based on the result of inoculation of chickens with the sputum of ten patients who showed positive reactions with avian tuberculin.) A positive reaction to avian tuberculin in pulmonary tuberculosis does not indicate latent infection with the avian tubercle bacillus. (This conclusion is based on the result of inoculation of chickens with necropsy material, including peribronchial lymph nodes, from three patients who had shown positive reactions with avian tuberculin.) The large percentage of positive reactions with avian tuberculin in tuberculous patients, observed by Maggiore, by Stewart and Collins, by L'Esperance, and by the author, must be considered only as a large percentage of group reactions in patients suffering from tuberculosis caused by the mammalian types of tubercle bacilli. In the presence of positive cutaneous reactions with mammalian tuberculins a positive reaction with avian tuberculin cannot be taken as indicating an infection with the avian tubercle bacillus; but such infection may be assumed to exist when the reaction with avian tuberculin is positive while the reaction with other tuberculins is negative or considerably weaker.

Bacteriophage.—Applebaum and MacNeal present observations concerning the influence of pus, blood, blood corpuscles and blood serum on the activity of bacteriophage in vitro, and discuss briefly the possible relationship of such observations to an understanding of the behavior of bacteriophage in the body. They found that purulent exudate exerts a marked inhibitory influence on the lytic action of the antistaphylococcus bacteriophage, sufficient to explain the persistent survival of the bacteria in purulent collections within the body of a patient receiving treatment with potent bacteriophage. Even when diluted 1:1,000, a purulent exudate sometimes exerts a relative inhibitory effect in vitro. Heating the pus at 60 C. for thirty minutes diminishes this inhibitory effect only slightly. Similar dilutions of purulent exudate failed to show an analogous inhibitory influence on the lytic action of anti-colon bacillus bacteriophage. Undiluted citrated blood, undiluted defibrinated blood and diluted blood serum exercise an inhibitory influence on the antistaphylococcus bacteriophage, but there is considerable variation in behavior of different bacterial strains and apparently in behavior of different races of bacteriophage. Undiluted blood did not permit the multiplication of the colon bacillus under the experimental conditions employed, and the experiments with diluted serum failed to reveal a clearly evident inhibition of the anti-colon bacillus bacteriophage.

Kansas Medical Society Journal, Topeka

32: 325-360 (Oct.) 1931

The Physician and the Community. F. H. Slayton, Wichita.—p. 325.
The Present Medical Situation. C. D. McKeown, Wichita.—p. 329.
Modern Functions of the County Medical Society. W. J. Burns, Detroit.—p. 332.
Mastoiditis of Streptococcus Mucosus-Capsulatus: Case. La Verne B. Spake, Kansas City, Kan., and N. E. Lacy, Kansas City, Mo.—p. 339.
Letter from a Kansas Doctor to His Son. J. A. Dillon, Larned.—p. 341.

Maine Medical Journal, Portland

22: 173-190 (Sept.) 1931

General Clinical and Surgical Aspects of Disease of Biliary Tract. E. S. Judd, Rochester, Minn.—p. 174.
Heart in Thyroid Disease. E. H. Drake, Portland.—p. 178.
*Treatment of Congestive Heart Failure. P. D. White, Boston.—p. 182.
Untoward Effects in Spinal Anesthesia. I. M. Webber, Portland.—p. 186.

Treatment of Congestive Heart Failure.—According to White, congestive heart failure of more than slight degree, whether involving primarily the left ventricle or the right, must be treated as a serious condition. One should not temporize, for it is but a short step further to extreme heart failure of uncontrollable degree. The treatment of congestive heart failure of moderate degree consists in the first place of absolute rest in bed. This rest must be mental as well as physical, and it is often essential to have expert nursing care. A few days of help by day and night nurses may save the patient's life and shorten convalescence by weeks. Visitors and noise should be excluded. The rest in bed, helped by other measures, should be continued until the greatest possible gain

has been secured, but it may not be possible to eradicate every evidence of cardiac weakness. A good deal of judgment must be exercised in each case before allowing freedom from bed. The physical position of the patient is a highly important factor in the control of distressing breathlessness. Too often this fact has been neglected in the past, and very sick patients have been permitted to expend their strength in getting out of bed in order to pass the night sitting in chairs where they can breathe more easily but where sleep is difficult. This sort of thing happens regularly, even today, in the best hospitals, in spite of their equipment with Gatch beds, although such beds have helped and have relieved somewhat this faulty situation. The administration of digitalis is still the most important measure of all in the treatment of moderate and marked degrees of congestive heart failure. It can be given rapidly by mouth or intravenously or intramuscularly. If there is not extreme urgency, a satisfactory plan for rapid digitalization is to give two pills or tablets, of 1½ grains (0.1 Gm.) of digitalis leaf each, three times a day for two or three days, or three such tablets three times a day for one and one-half to two days (that is, for five or six doses). If faster digitalization than this is necessary, or if vomiting prevents the use of digitalis by mouth, the drug can be given intravenously, preferably in the dose of 5 cc. of an equivalent of a 10 per cent solution (such as digalen or digifoline); this dose should be repeated once after four to six hours, and once again in part or whole after another eight to twelve hours if a satisfactory effect has not already been obtained. Daily rations of 1½ grains (0.1 Gm.) of the leaf by mouth or of 1 cc. of an equivalent of a 10 per cent solution intramuscularly or intravenously should be started after one of the plans of rapid digitalization outlined has been carried out. The use of intravenous and intramuscular injections should be omitted as soon as possible, the drug being given by mouth thereafter. The administration of digitalis by rectum is quite unnecessary and unsatisfactory except perhaps in rare cases when digitalis suppositories (6 grains, or 0.4 Gm., each) may be tried, following the same dosage as by mouth or a little more. In the most severe or acute fulminating congestive failure, whether due to sudden left ventricular dilatation and pulmonary edema (as in cardiac asthma) or to sudden right ventricular dilatation with marked hepatic engorgement and cyanosis, the treatment should be much the same. The emergency measures are the hypodermic injection of one-fourth grain (0.016 Gm.) of morphine sulphate and venesection, consisting of the removal of from 300 to 600 cc. of blood from an arm vein. The upright position for the thorax and head is essential. Digitalis in full dosage should be begun at once if it has not already been given and its effect later maintained for months at least. Or if digitalis has not previously been administered, strophanthin (ouabain) may be injected intravenously in the dose of $\frac{1}{120}$ to $\frac{1}{240}$ grain (0.5 to 0.25 mg.). Strychnine, epinephrine, caffeine, camphor and dextrose are of much less use or of no value at all.

Medical Journal and Record, New York

134: 261-312 (Sept. 16) 1931

United States Senate Takes Step in Scientific Medicine. J. W. Kennedy, Philadelphia.—p. 261.
Lumbosacral Spondylitis with Bilateral Radiculitis: Personal Experience. H. Hallarman, New York.—p. 263.
Erythema Multiforme and Erythema Nodosum with Streptococcic Sore Throat. H. T. Goldstein, Camden, N. J.—p. 266.
Some Notes on Technic of Obtaining Autopsies. H. Charache, Brooklyn. —p. 268.
Subcutaneous Basal Cell Epithelioma with Node Metastasis. H. Goodman, New York.—p. 271.
Electrolysis in Skin Disorders: Indications, Contraindications and Technic. G. M. Lewis, New York.—p. 272.
Modern Conception of Deafness. H. Hays, New York.—p. 276.
Physical Therapy in Daily Practice. R. Kovacs, New York.—p. 279.
Teaching of Physical Therapy. J. C. Elsom, Madison, Wis.—p. 283.
Electrocoagulation in Cancer. A. F. Tyler, Omaha.—p. 284.
The Galvanic Current. F. H. Morse, Boston.—p. 286.
Diathermy. F. Nagelschmidt, Berlin.—p. 287.
Diathermy in Diseases of Genito-Urinary Organs. E. P. Cumberbatch, London, England.—p. 288.
Removal of Tonsils by Diathermy. A. L. Forster, Chicago.—p. 290.
Medical Treatment of Rectal Hemorrhage and Pruritus Ani. M. S. Shaine, New York.—p. 295.
Indian and White Man. H. Jones, Circleville, Ohio.—p. 297.
A Medical Thesis of Long Ago: Relic of Early Medicine in Pennsylvania. W. R. Riddell, Toronto.—p. 298.

Missouri State M. Assn. Journal, St. Louis

28: 463-512 (Oct.) 1931

Early Diagnosis and Treatment of Acute Anterior Poliomyelitis. C. R. Ferris, B. L. Elliott and P. F. Stookey, Kansas City.—p. 463.
Control of Coronary Arterial Blood Supply in Relation to Angina Pectoris. C. W. Greene, Columbia.—p. 466.
Prognosis of Heart Disease. R. W. Holbrook, Kansas City.—p. 469.
Clinical Picture of Heart Disease. P. T. Bohan, Kansas City.—p. 470.
Treatment of Heart Disease. A. E. Strauss, St. Louis.—p. 474.
Mechanical Aids in Diagnosis of Heart Disease. S. B. Grant, St. Louis. —p. 477.
Tuberculosis in Children: Its Diagnosis and Prognosis. S. P. Child, Mount Vernon.—p. 481.
Determination of Activity in Tuberculosis. G. D. Kettelkamp, Koch. —p. 487.
Bandl's Ring. G. F. Pendleton, Kansas City.—p. 493.
Art of Strapping Backs. T. P. Brookes, St. Louis.—p. 496.

Nebraska State Medical Journal, Lincoln

16: 377-416 (Oct.) 1931

Significance of Psychoneuroses in General Practice of Medicine. F. G. Ebaugh, Denver.—p. 377.
Personal Experiences with Pyelography. C. F. Heider, North Platte. —p. 385.
Juvenile Asthma. W. O. Colburn, Lincoln.—p. 389.
Subacute Bacterial Endocarditis. J. C. Waddell, Beatrice.—p. 392.
Chylous Cysts of Mesentery: Case. J. E. Summers, Omaha.—p. 395.
Use of Spinal Anesthesia in Intestinal Distention. J. A. Weinberg and H. R. Sandstead, Omaha.—p. 398.
Old Perforations of Membrana Tympani Closed by Use of Heat. G. A. Griot, Chadron.—p. 402.

New England Journal of Medicine, Boston

205: 563-606 (Sept. 17) 1931

Graded Surgery in Common Duct Stones. H. M. Clute, Boston.—p. 563.
*Results with Friedman Modification of Aschheim-Zondek Test for Diagnosis of Early Pregnancy. M. Davis, Boston, and Elisabeth W. Walker, Arlington, Mass.—p. 566.
Adequate County Health Organization, Tuberculosis Control and Medical Profession. D. B. Armstrong, New York.—p. 569.
Study of Twenty Cases of Sacro-Iliac Tuberculosis at Lakeville State Sanatorium. G. L. Parker, Chicago.—p. 573.
Treatment of Acute Intestinal Intoxication Based on Clinical Findings in Colon. L. P. Crawford, Wollaston, Mass.—p. 577.
*Therapeutics and Toxicology of Sulphocyanates. J. C. Healy, Cambridge, Mass.—p. 581.
Congenital Heart Disease: Case with Malformation of Auricle and Hemorrhagic Effusion into Pericardium. H. S. Reid, Cohasset, Mass. —p. 583.
Prevention of Colds by Vaccine Therapy. H. G. Murray, Framingham. —p. 586.
Case of Benign and Malignant Tumors of Colon. G. Levene, Norwood, and Helen Matthews, Boston.—p. 588.

205: 607-656 (Sept. 24) 1931

Some Observations on Use of Roentgen Ray in Diagnosis of Surgical Diseases of Chest. G. W. Holmes, Boston.—p. 607.
Acute and Traumatic Lesions of Chest. H. Binney, Boston.—p. 610.
Work of Section of Surgery of Massachusetts Medical Society and Men Who Did It. F. B. Lund, Boston.—p. 615.
The Paget Tradition. G. G. Turner, Newcastle-upon-Tyne, England. —p. 622.
Surgical Treatment of Certain Chronic Diseases of Lungs and Pleura. W. Whittemore, Boston.—p. 629.
Summary of Surgical Treatment in Certain Thoracic Lesions. S. W. Harrington, Rochester, Minn.—p. 632.

205: 657-702 (Oct. 1) 1931

Henry Jacob Bigelow Lecture: Some Experiences in Surgery of Esophagus. G. G. Turner, Newcastle-upon-Tyne, England.—p. 657.
Sudden Death in Case of Asymptomatic Subacute Bacterial Endocarditis. G. L. West, Newton Centre, Mass.—p. 675.
Pregnancy and Fibromyoma: Case Complicated by Rectal Obstruction. S. R. Meaker, Boston.—p. 679.
Laboratory Study of Gonococcus: Clinical and Bacteriologic Study Made of Special Group of Cases. B. F. Boland and W. Cochran, Boston. —p. 680.
Treatment of Peritonitis Resulting from Perforated Viscus. G. C. Wilkins, Manchester, N. H.—p. 682.

Aschheim-Zondek Test.—According to Davis and Walker, the Friedman modification of the Aschheim-Zondek test for the diagnosis of early pregnancy is performed by a single intravenous injection of 10 cc. of the first voided morning urine into the marginal ear vein of a rabbit. This technic is much more simple than the original Aschheim-Zondek technic, and the test can be read at the end of from twenty-four to thirty-six hours, instead of at the end of 100 hours. The test is very delicate and highly accurate. The development of methods for concentrating the hormone from the urine will probably enable diagnosis to be made at even shorter intervals. It can be used for the differential diagnosis in the case of pelvic masses or

neoplasms, and in menstrual irregularity of various types. Early pregnancy can be ruled out in cases in which some form of instrumentation of the uterus is to be undertaken. Death of the ovum may be diagnosed, and, as its action is similar to that of the established Aschheim-Zondek test, the modified test can be used to determine the presence of active placental tissue in incomplete abortions, hydatidiform mole, and chorioepithelioma.

Sulphocyanates.—Healy presents a brief review of the literature on the therapeutics and toxicology of potassium sodium sulphocyanate, three cases illustrating a form of intoxication hitherto unreported, and experimental evidence on the toxicology of the drug. The clinical and experimental data suggest that the drug is cumulative when the avenues of its normal excretion are obstructed, even though by the best laboratory methods one cannot demonstrate such obstruction, and that the site of action is in the suprarenals. It appears that hypertension as a disease is a generalized condition of the organism which requires increased arterial tonus to maintain function and that any drug which has the power to reduce this tension to the average normal leads to disaster. On the basis of his observations the author concludes that the sulphocyanates in doses large enough to reduce blood pressure appreciably are toxic and may destroy life. The syndrome of hyposuprarenia has been produced clinically and experimentally with what have been described as therapeutic doses of sulphocyanate. The drug is cumulative under certain conditions. Other symptoms of intoxication, such as gastro-intestinal weakness, rash, dermatitis and psychosis, may in fact be manifestations of hyposuprarenia of greater or less degree. The incidence of intoxication increases with the age of the patient.

New York State Journal of Medicine, New York

31: 1189-1246 (Oct. 1) 1931

*Maternal Mortality Rate Computed and Standardized by New Method. R. J. Lowrie, New York.—p. 1189.
Idiopathic Choledochus Cyst: Case. F. M. O'Gorman, L. Chely and C. F. Heyden, Buffalo.—p. 1196.

31: 1247-1309 (Oct. 15) 1931

Present Status of Postoperative Treatment. C. V. Burt, New York.—p. 1247.
Veterinary Aspects of Undulant Fever. J. F. de Vine, Goshen.—p. 1255.
Psychiatry in Relation to Literature. L. J. Bragman, Syracuse.—p. 1259.
Importance of Ventilation in Oxygen Tent and Oxygen Chamber Therapy. A. L. Barach, New York.—p. 1263.
Present and Needed Health Services in Monroe County. J. L. Hazen, Brockport.—p. 1266.
Present Status of Acute Appendicitis in a General Hospital. P. Guptill and J. J. Morton, Rochester.—p. 1268.
Lupus Vulgaris of Nose and Upper Respiratory Tract: Treatment with Radium. E. M. Freund, Albany.—p. 1273.
Routine Procedure for Studying Allergic Patients. Katharine Baylis MacInnis, Binghamton.—p. 1277.

Maternal Mortality Rate Computed by a New Method.—In computing the maternal mortality rate, Lowrie utilizes the proportional algebraic equation in conjunction with the principle of sampling to ascertain from a given number of live births the corresponding number of women with viable pregnancy. This, divided into the number of deaths in women with viable pregnancy, gives the death rate in the child-bearing group of women. If from this rate the rate in the non-child-bearing group is deducted, the difference is the true mortality due to pregnancy and childbirth per se. The method, depending mainly on fixed quantities, population figures, births, deaths and time, can be used for standardization of the rate so that for all countries there is a common yardstick. The method may also be used to test the accuracy of the present method of calculating the rate (maternal deaths per thousand live births) so far as this rate depends on the estimate of maternal deaths.

Northwest Medicine, Seattle

30: 389-436 (Sept.) 1931

Diagnosis and Treatment of Acute Intestinal Obstruction. O. H. Wangensteen, Minneapolis.—p. 389.
Sympathetic Alcoholic Injection for Relief of Arteriosclerotic Pain and Gangrene. P. G. Flothow, Seattle.—p. 408.
Galvanic Therapy. C. A. Smith, Seattle.—p. 413.
Zoster Infection: Recent Investigations of Its Nature, with Histories of Two Unusual Cases. S. E. C. Turvey, Everett.—p. 417.
An Acute Exacerbation of Morbus Menieri Accompanying Herpes Zoster of Thoracic Region. A. B. Murphy, Everett.—p. 419.

Pennsylvania Medical Journal, Harrisburg

35: 1-56 (Oct.) 1931

Presidential Address. W. H. Mayer, Pittsburgh.—p. 1.
Physical and Chemical Changes of Spinal Fluid as Diagnostic Aid for Spinal Tumors. P. Jaisohn, Reading.—p. 7.
Unusual Case of Suprachoroidal Hemorrhage with Cyclodialysis and Detachment of Descemet's Membrane. A. J. Guerinot, Pittsburgh, and R. Castroviejo, Chicago.—p. 9.
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Mycosis Fungoides. R. D. Snively, Philadelphia.—p. 15.
Clinical Diagnosis of Acute Intestinal Obstruction. H. K. Seelaus, Philadelphia.—p. 17.
Syphilis of Pharynx and Larynx: Four Cases. A. H. Persky, Philadelphia.—p. 20.
Medical and Dental Professions: Need and Opportunities for and Advantages in Cooperation. J. D. Whiteman, Mercer.—p. 24.
Aneurysm of Aorta with Rupture into Pericardium Simulating Acute Coronary Thrombosis. J. M. Dyson and T. G. Schnabel, Philadelphia.—p. 27.
Carcinoma of Colon—Cecum to Anus. M. Behrend, Philadelphia.—p. 29.
Concurrent Sliding Femoral Epiphysis and Osgood-Schlatter's Disease. L. E. Snodgrass, Philadelphia.—p. 34.

Philippine Journal of Science, Manila

46: 159-304 (Oct.) 1931

Rat-Bite Fever in the Philippines. Ana Vazquez-Colet, Manila.—p. 159.
Interpretation of Laws of Brown and Pearce That Govern Course of Treponematoses. O. Schöbl, Manila.—p. 169.
Coexistent Infection with Yaws and Syphilis. O. Schöbl, Manila.—p. 177.
Prospects of Vaccination and Vaccine Therapy in Treponematoses. O. Schöbl, Manila.—p. 183.
Decay of Wood in Automobiles in Tropics. C. J. Humphrey, Manila.—p. 189.
Composition of Philippine Peanut Oil. A. O. Cruz and A. P. West, Manila.—p. 199.
New or Interesting Oriental Ferns. E. B. Copeland, Berkeley, Calif.—p. 209.
Efforts Toward Biologic Control of Common Pink Mealybug Trionymus Sacchari (Cockerell) of Sugar Cane on Negroes. F. C. Hadden and A. W. Lopez.—p. 221.
Kahn Test in Clinical Syphilis. C. Monserrat, Manila.—p. 225.
Comparative Serologic Study of Vernes, Wassermann and Kahn Reactions in Experimental Treponematoses. C. Monserrat, Manila.—p. 241.
Malaria Transmission in Philippines: IV. Meteorological Factors. C. Manalang, Manila.—p. 247.
Leaf and Seed Structure of a Philippine Coriaria. J. K. Santos, Manila.—p. 257.
New or Little-Known Tipulidae from the Philippines (Diptera). XI. C. P. Alexander, Amherst, Mass.—p. 269 .

Public Health Reports, Washington, D. C.

46: 2041-2091 (Aug. 28) 1931

*Medical Profession and Health Department. A. J. McLaughlin.—p. 2041.
Report on Some Tests of the Use of a New Cyanogen Product in Ship Fumigation. C. L. Williams.—p. 2048.

The Medical Profession and the Health Department.—To McLaughlin, state medicine appears as a miserable makeshift. It is un-American, ultrapaternalistic, and destructive of self-respect in both physician and patient. It is a failure in Germany, in England, and in other European countries. It is, from an American point of view, a pauperizing influence, wrong in principle and doomed to failure in practice if Americans should ever be foolish enough to try it.

Southwestern Medicine, Phoenix, Ariz.

15: 397-448 (Sept.) 1931

Relations Between Public Health Administration and Private Practice. J. R. Earp, Santa Fe, N. M.—p. 397.
Chronic Frontal Sinusitis. R. A. Duncan, Amarillo, Texas.—p. 399.
Serum Treatment of Lobar Pneumonia. R. E. McBride, Las Cruces, N. M.—p. 403.
Tribromethylalcohol Anesthesia. P. L. Travers, Gallup, N. M.—p. 405.
Résumé of Diet Therapy. C. H. Gellenthien, Valmora, N. M.—p. 409.
Injection Treatment of Varicose Veins. J. L. Murphy, El Paso, Texas.—p. 415.
Review of Literature and Some Suggestions on Septic Sore Throat. M. B. Culpepper, Carlsbad, N. M.—p. 419.
Malunion and Nonunion of Fractures. J. E. Shearer, Whipple, Ariz.—p. 421.
Minimum Equipment of General Hospitals for the Transportation and Emergency Treatment of Fractures. H. T. Southworth, Prescott, Ariz.—p. 425.
Case of Streptococcic Pneumonia: Discussion and Autopsy Report. H. Randolph, Phoenix.—p. 426.
Deaths in Good Samaritan Hospital (Phoenix). J. D. Hamer, Phoenix.—p. 428.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 555-592 (Sept. 26) 1931

Remarks on Case of Intracranial Tumor. A. F. Tredgold and E. T. Ruston.—p. 555.
*Menorrhagias Not Due to Uterine Disease: Causation, Clinical Features, and Treatment. J. Young.—p. 556.
Physiologic Aspects of Menstruation. A. S. Parkes.—p. 559.
Varicose Ulcer. A. D. Wright.—p. 561.
Case of Achalasia of Cardia. H. B. Butler.—p. 565.
Investigation of Diphtheria Carriers. J. Grant.—p. 566.
*Epidemic Meningitis Minor. J. V. C. Braithwaite and W. M. Innes. —p. 567.

Menorrhagias Not Due to Uterine Disease.—Young believes that except after a recent childbed infection or gonorrhea, inflammation of the endometrium or myometrium is a rare cause of irregular and excessive uterine bleeding. There is evidence that in a large majority of such cases the uterine pathologic changes—the endometrial proliferation and congestion and the myohyperplasia—and the symptoms are dependent on aberration in the ovarian functioning. The most common recognizable causes of this aberration are childbirth and general organic disease. The terms chronic endometritis, chronic metritis, fibrosis uteri, and subinvolution applied to the pathologic condition found in irregular and excessive uterine bleeding are, therefore, inappropriate. The diagnosis in such cases rests on an absence of a gross pathologic condition—tumors, placental remains, tubo-ovarian inflammatory masses, and so on—and the appearances found in the endometrium after curettage. The treatment consists of curettage, ovarian therapy or, in intractable cases, of the use of sterilizing doses of radium or roentgen rays.

Epidemic Meningitis Minor.—Braithwaite and Innes report that thirteen patients with symptoms of meningitis were admitted to the hospital in six and a half weeks during the early spring of this year. Eight of the thirteen had coincident bronchopneumonia. All of the patients were young children; ten were boys. The cerebrospinal fluid was under pressure, clear and sterile. The protein tended to be increased slightly, but usually there was no other abnormality. Lumbar or cisternal puncture caused rapid and complete disappearance of the symptoms. The condition may be an abortive form either of influenzal or of cerebrospinal meningitis. In the cases described it was probably the former. The disease, while resembling that described by Quincke as serous meningitis, shows several important differences, particularly in its benign course. The authors suggest that the name "meningitis minor" is preferable.

Journal of Mental Science, London

77: 465-668 (July) 1931

Standardization of Wassermann Reaction for Use of Mental Hospital Laboratories. W. M. Ford-Robertson.—p. 468.
Investigation Into Position in Family of Mental Defectives. F. D. Turner and L. S. Penrose.—p. 512.
Blood Sugar Studies in Abnormal Mental States. P. K. McCowan and J. H. Quastel.—p. 525.
Mental Disorders Associated with Pernicious Anemia. N. R. Phillips. —p. 549.
Antimalarial Work at Central Mental Hospital, Tanjong Rambutan, Malaya. W. F. Samuels.—p. 555.
Correlation of Cause of Death with Type of Insanity. L. C. F. Chevens. —p. 562.
Terminal Uremia: Prevalence of Renal Disease Among the Insane. A. G. Shera.—p. 573.
On Freud. W. Burridge.—p. 582.
On Janet. W. Burridge.—p. 594.

Journal of Tropical Medicine & Hygiene, London

34: 317-336 (Oct. 1) 1931

Case of Bilharzia Disease Complicated by Jaundice. F. G. Cawston. —p. 317.
Some Aspects of Colon Group of Organisms, with Especial Reference to Water Supplies of Trinidad. J. L. Pawan.—p. 317.
Consideration of Uses of Cow-Dung in Basutoland. F. G. Cawston.—p. 328.

Kenya & East Africa Medical Journal, Nairobi

8: 149-177 (Sept.) 1931

Preliminary Note on Pneumonia in Nairobi with Particular Reference to Type-Incidence of Pneumococcus. P. C. C. Garnham and F. P. G. de Smidt.—p. 150.
Syphilis and Yaws in South Kavirondo. W. Wilkinson.—p. 164.

Lancet, London

2: 723-778 (Oct. 3) 1931

Physiology of Painful Sensation in Relation to Some Clinical Problems in Neurology. C. P. Symonds.—p. 723.
*Abduction Treatment as Practicable Routine for All Types of Fracture at Hip Joint. R. Whitman.—p. 726.
*Blood Sugar Studies in Abnormal Mental States. P. K. McCowan and J. H. Quastel.—p. 731.
Spasmus Nutans (Head Nodding) as Associated with Defective Lighting in the Home. D. Paterson and R. W. B. Ellis.—p. 736.
Consecutive Autopsies of Unusual Interest. I. B. Morris.—p. 737.

Abduction Method in Fracture of Hip Joint.—According to Whitman, the abduction treatment which has extended the range of effective treatment to the aged class has expanded it in far greater degree in what was formerly an unknown region, that of childhood and adolescence. In childhood the direct fracture is usually of the greenstick type, "traumatic coxa vara," which may be readily corrected if the diagnosis is made within a reasonable time; otherwise the shaft should be divided at the level of the trochanter and abducted to the degree that corresponds with the angle of the neck, thus restoring indirectly its normal inclination when, after consolidation, the limb is replaced in the line of the body. The abduction method is effective for the epiphyseal fracture, and also for the incomplete so-called epiphyseal slipping of adolescence if seen in the early and progressive stage. In neglected or resistant cases the open operation will be required for the replacement of the head in its proper relation to the neck. It is also the most effective treatment for the relatively rare cases of fracture of the acetabulum with inward displacement of the head. Finally, there are many cases of ununited fracture of long standing in which the destruction of the neck makes the ordinary pegging operation impracticable. In such cases what has been called the reconstruction operation is the most effective procedure. The trochanter is separated at its base, thus providing a sufficient area of bearing surface and, the head having been removed, the improvised neck is inserted in the acetabulum at an angle of about 25 degrees of abduction and the trochanter with its attached muscles is transplanted to the outer border of the shaft; thus muscular control, a fair range of motion, and security of support are established.

Blood Sugar in Mental Cases.—McCowan and Quastel made a study of the sugar tolerance curves of eighty-five psychotic subjects. The hyperglycemic index is defined. It is a quantitative measure of the departure of a sugar tolerance curve from that found in a normal case. It is an expression of the sustainment of hyperglycemia found in many psychotic cases. It is shown that: 1. In the manic-depressive group there is the closest parallelism between the magnitude of the index and the emotional tension of the patient. Out of forty-three melancholic patients examined, only ten gave a normal or slightly abnormal index. An explanation is given for this anomalous behavior of the ten patients. 2. In the schizophrenic group there is a relatively low incidence of patients (two out of twenty-nine) showing an index consistently greater than 50. High figures in the schizophrenic group are associated with toxemia, endocrine imbalance, or other physical disorder. In cases of mania a low index is recorded, except when the excitement is accompanied by an aggressive, paranoid mood. In cases of benign stupor a low index has been recorded, showing that the defense mechanism of the stupor reaction had succeeded in abolishing the emotional tension. Arteriosclerosis alone is not a cause of a high index. During menstruation there is a departure from the normal sugar tolerance curve in both normal and psychotic cases. Practical use is made of the hyperglycemic index in determining prognosis, progress and recovery of the patient.

Medical Journal of Australia, Sydney

2: 345-374 (Sept. 19) 1931

Bacteriologic Findings in Puerperal Sepsis. Lucy M. Bryce.—p. 345.
Prophylaxis of Puerperal Fever. A. M. Wilson.—p. 350.
Physiology and Pathology of Ovary and Genital Tract. R. F. Matters. —p. 357.
Examination of Aschheim-Zondek Test for Pregnancy. G. V. Rudd.—p. 359.
Anterior Pituitary Hormone and Aschheim-Zondek Pregnancy Test. K. Ehrhardt and B. T. Mayes.—p. 361.
Comparative Physiology of Accommodation: Problem in Biology. W. A. Osborne.—p. 363.

Presse Médicale, Paris

39: 1325-1340 (Sept. 9) 1931

*Throat Streptococci in Epidemic of Puerperal Fever. P. Courmont and P. Sédallian.—p. 1325.
*Modification in Supravital Staining of Blood. J. Bauer.—p. 1326.

Midwife a Carrier of Streptococci in Epidemic of Puerperal Fever.—Courmont and Sédallian discuss an instance in which a midwife, a passive carrier of a hemolytic streptococcus, caused puerperal infection in six with a resultant death in one of eleven deliveries within a period of eighteen days. The midwife developed a hemolytic streptococcic angina about the ninth day. Studies of the organisms isolated from the carrier and the infected patients proved that the organisms were culturally identical. The authors stress the recognition of the importance of droplet infection as a source of epidemic infection and advise a stringent and careful aseptic technic during all deliveries.

Modification in Supravital Staining of Blood.—In his studies of reticulocytes, Bauer finds the following method of blood staining highly satisfactory. He uses a 2 per cent solution of brilliant cresyl blue (1 Gm. of stain dissolved in 50 cc. of warm distilled water). The solution filtered carefully keeps many weeks. The May-Grünwald stain is used for the differential white cell count. As often as possible new glass slides should be used and these should be carefully cleaned and flamed. The materials should all be ready; including a slide with polished edges, a glass rod with the bottom flattened in the form of a spatula, a lancet, some ether, and wads of cotton. The digital finger is cleaned with ether and punctured with the lancet; the large drop of blood that appears is placed on the slide; with the glass rod a little of the cresyl blue solution is added to the blood (one part of stain to four or five parts of blood) and is mixed with the bottom of the glass rod until a brownish blue homogeneous emulsion is formed; this is allowed to stand from a minute and a half to two minutes, during which time two or three more slides are prepared. The edge of the polished slide is applied to the emulsion which spreads along the edge; the polished slide is withdrawn from the horizontal slide and placed on a new slide in such a manner as to obtain a thin and uniform smear solely with the blood adhering to the polished slide. The smears are fixed and stained with May-Grünwald stain for two minutes, and rinsed carefully with distilled water. They should not be dried in the flame. Even a person with little experience does not require more than seven or eight minutes to make three or four preparations. Examinations under oil immersion should include only the uniform and thin parts of the smear, where the cells are intact and separated one from the other, and where the nuclei of the leukocytes are stained deep blue. More than one preparation should be examined. Under the microscope the red cells are uniform red disks and the granuloreticulofilamentous substance is stained a deep blue and takes the form of rods, filaments and plexuses; often the reticular substance is sufficiently dense to fill the entire cell and sometimes so fine as to escape any but close scrutiny. This contrast stain makes the differential counting of reticulocytes simple. To get absolute results, care must be taken in following directions: having clean slides, mixing the blood in exact proportions, having a drop large enough to prevent drying, yet small enough to make a thin film. The author stresses the advantages of this modification, the simplicity and rapidity of execution and the beautiful picture that is obtained.

39: 1357-1372 (Sept. 16) 1931

Hyperacute Bilateralization in Tuberculous Patients with Artificial or Spontaneous Pneumothorax. A. Ravina, J. Delarue and D. Douady.—p. 1357.
*Hirudin in Treatment of Phlebitis, Septicemia and Various Diseases of Bacterial Nature. V. Dimitriu and G. O. Somnea.—p. 1359.

Hirudin in Treatment of Phlebitis, Septicemia and Various Diseases of Bacterial Nature.—Dimitriu and Somnea discuss the various theories regarding hirudin in the treatment of phlebitis. They state that their experiments do not prove that hirudin should be used in the treatment of phlebitis but rather that it should be used as a preventive measure. Studies of statistics prove that postoperative phlebitis occurs most frequently following operations on the rectum, stomach, appendix and other organs that contain a greater number of septic products. The authors believe that phlebitis is an infectious process. After operation the various bacteria penetrate into the blood; these bacteria are attenuated and cannot set up true septicemia and circulate for a time in the blood; and since circulation of the blood after operation is slow, and the reticulo-endothelial system more or less blocked, the bacteria are able to collect and assure the formation of the phlebitis clots. In their experiments the effect on the blood was studied by application of leeches directly as well as by subcutaneous injection of carefully sterilized hirudin-containing plasma. India ink injected into guinea-pigs did not counteract the action of the hirudin-containing plasma injected twenty-four hours previously. Two hundred patients with gynecologic disorders and with diseases of the rectum and alimentary canal did not feel any inconvenience in consequence of the hirudin treatment from twenty-four to forty-eight hours after operation. Not one postoperative pulmonary congestion was noted, whereas previously the incidence of congestion was 12 per cent. The authors conclude as follows: Hirudin hastens the exchange of leukocytes between the reticulo-endothelial system and the blood; the leukocytes, by their displacements, remove the bacteria from the blood, thus suppressing the cause of phlebitis. Hirudin associated with fixation abscess was used in the treatment of septicemias; and when fixation abscess was not effective (the authors believe this was due to a blockade of leukocytes in the reticulo-endothelial system), injections of epinephrine followed by injection of hirudin-containing plasma facilitated the displacement of the leukocytes and the removal of the reticulo-endothelial blockade.

Revista Sud. Am. de Endocrinol., etc., Buenos Aires

14: 499-568 (Aug. 15) 1931

*New Form of Hodgkin-Paltauf-Sternberg's Disease: Addison's Syndrome and Granulomatosis. R. Ruiz.—p. 499.

Addison's Syndrome and Granulomatosis.—Ruiz reports the clinical history of a tuberculous and syphilitic man aged 47 in whom nearly all the manifest disorders, such as pigmentation of the skin with hyperpigmentation of the mucous membranes, asthenia and low blood pressure, indicated Addison's syndrome. The patient had also fever, convulsions of an ischemic origin and adenopathy. He died and the necropsy revealed that all these changes had been caused by a splenolumbo-aortic granulomatosis. The author supports Spangenberg's opinion on the advisability of regarding certain forms of granulomatosis simulating Addison's disease as a new clinical type of tuberculosis. The clinical picture of the type coincides with the symptomatology given by the author's patient. Sympathetic and endocrine factors play a part in the pathogenesis of the disease (in the author's case lesions of the solar plexus complicating a dysfunctioning of the cortex of the suprarenals were found). In order to reach a clear diagnosis it is necessary first to make a differential diagnosis between Addison's syndrome and a pseudosyndrome resembling Addison's disease. Since the two principal symptoms of Addison's syndrome are typical asthenia and skin pigmentation, the fact that one of the symptoms is nontypical indicates the presence of a pseudosyndrome, which, if complemented by the positive diagnosis for granulomatosis, gives the clear diagnosis of the new type of granulomatosis. The determination of the blood formula and the biopsy of a lymph node (repeated if necessary) will help to make the precise diagnosis of granulomatosis. The treatment of this clinical type should be the same as that for general granulomatosis. Medical and surgical treatments have been resorted to in granulomatosis without success, though the evolution of the disease is not rapid. Roentgen treatment has given the best results.

Beiträge zur Klinischen Chirurgie, Berlin

153: 161-320 (Aug. 22) 1931

*Surgery with High Frequency Current. E. Heymann.—p. 161.
Clinical Aspects of Calcaneodynia. W. Jaroschy.—p. 192.
Fate of Patients Who Underwent Surgical Treatment on Account of Pulmonary Echinococcus. M. Makkas and B. Kurias.—p. 201.
Secondary Fractures of Patella. C. Barthels.—p. 233.
Fracture of Spinal Column and Its Relation to Syphilis and Pernicious Anemia. L. Strauss.—p. 238.
*Healing of Wounds Following Operation by Means of High Frequency Current, with Especial Consideration of Surgery of Mouth, Jaw and Face. E. Hauberrisser.—p. 257.

*Studies on General Metabolism Following Total Extirpation of Stomach and Following Extensive Resection of Intestine. K. Shima.—p. 275.
Suppurative Inflammation of Jaw Bones. S. Frey.—p. 300.
Exophthalmic Goiter in Senility and "Toxic Adenoma." O. Hoche.—p. 314.

Surgery with High Frequency Current.—Heymann discusses primarily technical shortcomings and disadvantages of the electrosurgical procedure, but his object is not to discourage electrosurgery. On the contrary, he is convinced that no one who has had experience with electrosurgery will ever give it up. Yet the disadvantages and dangers, such as explosions, burnings, late hemorrhages, spasms and the jeopardization of the asepsis, should not be disregarded, for only if these disadvantages are reported, discussed and investigated will it be possible to find ways and means to prevent them. This was the author's object in calling attention to certain shortcomings, yet he also gives advice as to how they are to be prevented, and at the same time he describes several technical improvements in the surgical use of the high frequency current.

Healing of Wounds Following Operation by Means of Hight Frequency Current.—Hauberrisser found that the healing of primarily sutured wounds of the oral mucous membrane takes a characteristic course. The healing process of the mucous membrane of the palate and that of the cheek are much alike. In both tissues the epithelium that has been injured by the heat, as well as the subepithelial connective tissue, is cast off within the first few days. Then small hemorrhagic foci develop, because the casting off of the necroses causes a reopening of the coagulated capillaries, and thus there is a "secondary" fibrin agglutination, which forms a protective closure. The necrotic parts that have remained in the deeper tissue layers cause a resorptive inflammation. This healing process is more rapid in the mucous membrane of the cheek than in the more firm mucous membrane of the palate. The healing of the wounds of the tongue after electrosurgery is unique in that the epithelization is generally just as rapid as if surgery had been done with the scalpel. In the case of the skin the conditions are more unfavorable because of the wide zone of necrosis that develops as a result of the heavy layer of connective tissue and because of the firmness of the epithelium, which prevents an early casting off of the external necrotic layers (as in the case of the delicate mucous membrane) and thus prevents the early "secondary" fibrin agglutination. The absence of the fibrin closure makes invasion of bacteria possible, and the necrotic layer is an ideal medium for the infectious organisms. From these observations the author concludes that cutting by means of the high frequency current is not advisable in flap plastic procedures on the palate and on the cheek. In interventions on the tongue, however, electrosurgery may be employed without hesitation. In surgery of the face it is not advisable because of the retarded healing and the unfavorable cosmetic results, and the scalpel should be used instead. In some instances a combination of the two may be helpful.

Studies on Metabolism Following Extirpation of Stomach.—Shima studied the metabolism of three patients with gastric cancer following total extirpation of the stomach, and of eleven patients who had undergone extensive resection of the intestine on account of intestinal tuberculosis. He found that total extirpation of the stomach resulted in a disturbance of the fat metabolism, but the protein metabolism showed disorders in only one of the three patients and the carbohydrate metabolism was not at all influenced. In observations on the patients with intestinal tuberculosis the author found that in a certain stage of tuberculosis the metabolism may be normal in spite of the fact that the tuberculous foci involve large portions of the intestine. However, if the disease process becomes exacerbated, metabolic disorders develop and involve first the fat metabolism and gradually also the protein metabolism. The carbohydrate metabolism remains unimpaired during the entire period and even compensates for the deficiency in the other nutritional substances. Following extensive resection of the intestine, its resorption capacity is at first impaired, but after a certain time there is an improvement in the resorptive conditions resulting from the compensatory action of the remaining portion of the intestine, and this improvement becomes manifest in the patient's general condition. The prognosis in resection of the intestine can be based only on the condition of the general metabolism before the operation; that is, on the resorption capacity for the main nutritive substances and not on the extension of the tuberculous process. The prognosis is unfavorable when the carbohydrate metabolism is impaired. In extensive tuberculous processes of the intestine, resection should be resorted to only under certain conditions and during a certain stage of the disease.

Deutsche Zeitschrift für Chirurgie, Leipzig

232: 493-700 (Aug. 24) 1931

Treatment of Carbuncles by Injection of Solution of Arnica. W. Gerlach.—p. 493.
*Results of Roentgen Irradiation in Tuberculosis of Bones and Joints. H. Hanke.—p. 515.
Sterilization of Powders, Particularly of Wound Dusting Powders. Muntsch.—p. 531.
*Axillary Lymph Nodes in Cancer of Mamma. K. von Haefen.—p. 542.
Roentgenologic and Roentgenocinematographic Studies on Circulation. T. Naegeli and R. Janker.—p. 560.
Roentgenocinematographic Investigations During Pressure Fluctuations in Thoracic Cavity of Experimental Animals. R. Janker.—p. 570.
Studies on Parabiosis. K. Kojima.—p. 578.
*Giant Growth of Toes and of Colon. F. Windholz.—p. 634.
Isolated Fractures of Pisiform Bone and Their Treatment. B. F. Diwnogorski.—p. 648.
Significance of Extravasation of Blood in Healing of Fracture. H. Fuss and K. Faber.—p. 658.
Casuistics of Exostosis Cartilaginea Multiplex Hereditaria. H. Henninger.—p. 666.
Calcification of Ligamentum Iliolumbale. E. Lehmann.—p. 674.
*Substitute for Ligament of Patella. E. König.—p. 678.
Early Case of Ganglion on Lateral Meniscus of Knee Joint. E. Krapf.—p. 682.
Gastric Ulcer in Patient with Echinococcus Cyst of Liver. D. Maluschew.—p. 684.
Nephrosis Experiments on Parabiotic Rats. F. Dannheisser.—p. 688.

Roentgen Irradiation in Tuberculosis of Bones and Joints.—Hanke reports his observations on 121 patients with tuberculosis of the bones and joints, who were treated primarily with roentgen rays. He considers roentgen irradiation a valuable aid in the treatment of this condition but says that the general climatic-dietary treatment should not be neglected and that in some cases surgical and orthopedic measures are necessary. Just as in the general treatment one should not employ the same method in every case, in roentgen therapy one should likewise avoid schematization. The general condition and the development of the case should be considered when the advisability of roentgen treatment is decided on. The author is unable to state definitely which forms yield most readily to roentgen therapy but he thinks that the smaller joints and smaller processes are more easily influenced than the larger ones. Roentgen irradiation may be tried in the majority of cases; but if the processes are extremely acute, if there is a generalized phthisis, and also if the processes show marked caseation and if there is a mixed infection, roentgen treatment is not advisable. As a rule, closed processes yield to roentgen rays more readily than fistulous ones, but even in the open forms roentgen treatment may be tried. Frequently old fistulas heal rapidly following a few irradiations. The results were highly favorable in fistulous suppurations following surgical intervention. Of especial significance is the fact that roentgen treatment usually has a favorable effect on the general condition of the patients. Painfulness and muscular contractions disappear, the joints can be moved more readily, and the patients gain in weight and strength. The author does not give general rules about the dosage of the roentgen treatment but he stresses that smaller doses (from 5 to 30 per cent of the unit skin dose) have the same or even a better effect than larger doses. Because of the possibility of producing an exacerbation and also to avoid late injuries, large doses are not advisable. That dose may be considered most effective which is inversely proportional to the activity of the tuberculous focus.

Axillary Lymph Nodes in Cancer of Mamma.—Von Haefen studied the changes in the axillary lymph nodes of patients with cancer of the breast. First he describes his observations on sixty-nine axillary lymph nodes that were free from cancer cells, and then on sixty-three axillary lymph nodes that contained cancer cells. All these 132 lymph nodes were from patients with cancer of the breast. On the basis of his

microscopic investigations on the development of cancer in the lymph nodes he concludes that cancer cells do not originate from the reticulo-endothelium within the lymph nodes but are brought from the primary tumor by way of the lymph channels and then multiply and spread within the lymph nodes. The author further discusses the predisposing factors and the mechanism of the spreading of cancer cells within the lymph nodes. Observations on his material showed that the same mechanism of dissemination that is found in one lymph node will be found in all the carcinomatous axillary lymph nodes of the same patient. The same conformity applies to the changes that are present in those lymph nodes that as yet do not contain cancer cells, and also to the regressive changes. The material further shows that if the same mechanism of dissemination is found in different patients there is also conformity in the character of the carcinoma.

Giant Growth of Toes and of Colon.—In the case of partial giant growth reported by Windholz the size of the toes was enormously increased as a result of proliferation of the fat tissues. Roentgenoscopy revealed dystrophic degenerative changes of the phalanges. The latter were enlarged and in several places were fused with one another. The bone structure was irregular. The roentgenogram showed larger and smaller roundish areas that appeared lighter, and there also were irregular areas of spongiosa. At the sites of the attachments of the muscles were cartilaginous exostoses of various sizes; the largest was on the posterior surface of the calcaneus. There were certain indications that the development of these exostoses was due not only to an anomaly of the periosteum but also to static factors. The partial giant growth was also noticeable on the colon. It was of normal length and width, but there was a marked proliferation of the fatty tissues in the region of the submucosa and of the subserosa, and it weighed seventeen times as much as a normal colon. The mucous membrane was thickened because of numerous submucous lipomas. The epiploic appendixes were likewise greatly enlarged. All other internal organs and the endocrine glands were normal and the nerves were likewise free from proliferations. The author states that in the literature there is not a record of another case of lipomatous giant growth of the colon. He thinks that the gigantism of the toes and of the colon are coordinated products of the same disturbance; namely, of the pathologic persistence of the proliferative potency of the mesenchymal tissues.

Substitute for Ligament of Patella.—For late cases of tearing of the ligament of the patella, in which direct suture is impossible, König advises a free transplantation of a portion of the fascia lata. He describes a case in which this procedure proved successful.

Zeitschrift für Klinische Medizin, Berlin

117: 443-666 (Aug. 22) 1931

*Clinical Aspects of "Rheumatic" Diseases. A. Fischer.—p. 443.
Influence of Ergotamine and Atropine on Galactose Assimilation in Patients With and Without Liver Disease. L. Pollak and A. Selinger. —p. 476.
Rôle of Fats in Treatment of Hyperacidity and of Gastric Ulcer. E. Haintz and L. Pauliczky.—p. 500.
Guttadiaphot VIII: Physicochemical Investigations on the Guttadiaphot Problem. H. A. Oelkers and R. Ammon.—p. 505.
Quantity of Circulating Blood in Course of Circulatory Diseases. P. C. Martinez.—p. 540.
Respiratory Reflex in Patients with Heart Disease: Functional Test in Cardiac Insufficiency. F. Bilski.—p. 553.
Epidemic Resembling Psittacosis in Animal Hospital. H. J. Schmid. —p. 563.
Epidemiology of Psittacosis-Like Disease. W. Frei.—p. 594.
Chlorides in Pure Gastric Juice. C. Dienst.—p. 602.
Blood Reaction in Pernicious Anemia During Anemic Stage and During Remission. K. Hitzenberger and F. Tuchfeld.—p. 607.
*New Differential Diagnostic Blood Serum Reaction. B. Purjesz and L. Dávid.—p. 627.
Cyanide Metabolism: Rôle of Liver in Intermediate Cyanide Metabolism. M. Schecter.—p. 637.
Id.: Combining Power of Animal Organs in Vitro for Hydrocyanic Acid and Its Modification by Thyroid Preparations or Thyroxine. M. Schechter.—p. 652.
Id.: Combining Capacity of Liver in Vitro for Hydrocyanic Acid. M. Schechter.—p. 657.
Id.: Splitting of Nitrile in Animal Organism and Its Modification by Thyroid Preparations or Thyroxine. M. Schechter.—p. 660.
Myeloma and Amyloid. Magnus-Levy.—p. 664.

Clinical Aspects of "Rheumatic" Diseases.—Fischer states that the term "rheumatism" is used for all disorders of the motor apparatus that belong in the therapeutic sphere of internal medicine and that are not recognized as partial manifestations of specific systemic diseases such as syphilis, tuberculosis or neoplasms. Thus the etiology of rheumatism is not strictly defined; and since acute as well as chronic processes, and articular as well as nervous disorders, are included in the term, it is too indefinite and not conducive to exact clinical diagnosis. The only positive factor of the disorders that are combined under the term rheumatism is the fact that they react favorably to physical therapy. Although the classification of articular disorders has made considerable progress for several decades, and many painful conditions that were formerly considered as of neuralgic character have been traced to pathologic changes in the vertebral column, it is only in the last few years that the term rheumatism has been more strictly defined. Investigations have revealed that in acute articular rheumatism there exist characteristic tissue changes, and for this condition the term infectious rheumatism has been recommended. In classifying the disorders of the motor apparatus belonging to the sphere of internal medicine the author mentions three main groups: (1) the various forms of polyarthritis of the general inflammatory type, to which belong acute articular rheumatism and chronic infectious arthritis (primary and secondary chronic polyarthritis); (2) the deforming arthropathies; (3) the myalgias and neuralgias, the latter being only rarely disease entities but usually caused by organic changes, especially of the vertebral column. The author discusses the clinical aspects, particularly the pathogenesis and diagnosis, of these various forms on the basis of a statistical report of 1,400 cases. With regard to therapy he emphasizes that for nearly all these conditions internal treatment is required and surgical and orthopedic measures are only rarely necessary. The prognosis he considers as comparatively favorable, provided the treatment is rational; that is, that it is based on a clear understanding of the pathogenesis. Infectious polyarthritis must be treated differently from static arthropathy, and active inflammatory processes differently from chronic degenerative processes. Liniments producing hyperemia may be helpful in acute myalgia; however, in chronic spondylosis such a treatment would be of little avail.

New Differential Diagnostic Blood Serum Reaction.—In the introduction to their paper, Purjesz and Dávid point out that the majority of tests that are employed for diagnostic purposes involve technical difficulties that make their use by the general practitioner almost impossible. For this reason they attempted to devise a method that not only would have a simple technic but also could be used for the diagnosis of various diseases. They aimed to accomplish this by a color reaction; that is, a reaction in which the appearance of readily differentiable color rings would indicate the presence of certain diseases. In order to be able to demonstrate the presence of substances characteristic for certain diseases, the authors' first aim was to find a suitable reagent. They name more than fifty substances which they studied. They further describe the technic of the method and state that they performed the test on more than 300 persons, some of whom were healthy and some of whom had syphilis, tuberculosis, cancer, icterus or pernicious anemia. It was found that the serums of healthy persons always gave the same color reaction, whereas the serum of patients showed discolorations and color rings typical for their ailment. In several apparently healthy persons, pathologic color reactions were noted and later the actual presence of the disease could be corroborated with the aid of other clinical methods. On a colored table the authors show the color reactions which they observed in tuberculosis, icterus catarrhalis, gallstone icterus, and pernicious anemia, and for comparison they show reactions in healthy persons. The mechanism of the reactions, that is, whether amino-acids or crystalloid substances play the important part, or whether the changes in the colors are due to the colloid lability of the plasma, is as yet not understood, but the authors intend to continue their studies on this problem, as well as on the practical uses of the test. Their object in making this report was to direct attention to their studies and to interest other workers to test and evaluate the method.

Zeitschrift für Krebsforchung, Berlin

34: 109-312 (Aug. 14) 1931

Clinical and Roentgenologic Observations on Development of Bronchial Carcinoma. A. Beutel and A. Woldrich.—p. 109.
Present Status of Experimental Tumor Production by Means of Embryonal Vaccination. N. Petrow and N. Krotkina.—p. 123.
Cancer Mortality of Jews. S. Peller.—p. 128.
*Effect of Spleen Transplantation on Behavior of Animal Tumors. F. P. Tinozzi.—p. 148.
Has Chimney-Sweep's Cancer Really Disappeared? Dütschke.—p. 159.
Experimental Tumor Production and Development of Lymphatic Organ Manifestations. H. J. C. Lund.—p. 163.
Production of Tumors in Domestic Mice by Means of Blood from Patients with Tumors. A. Košir.—p. 169.
Malignant Neuroblastoma in Cow. H. Baumgärtner.—p. 174.
*Significance of Reticulo-Endothelial System for Growth of Blastoma. B. E. Brüda.—p. 185.
Mitogenetic Radiation of Experimental Tar Cancer. S. J. Salkind and L. M. Schabad.—p. 216.
Allergic Phenomena in Skin Metastases of a Generalized Lymphosarcoma. H. Auler.—p. 228.
*Reactions in Cancer Patients Caused by Malaria and Their Relations to Reticulo-Endothelial System. A. Braunstein.—p. 230.
Heterologous Transplantation from Human Beings to Roentgenized Animals. C. Krebs and Fanny Busch.—p. 234.
Biochemistry of Cell Lipoids and Cancer Research. P. Rondoni.—p. 245.
Microscopic Diagnosis of Tumors by Means of Histochemical Cholesterol Reaction According to Schultz. X. Chahovitch.—p. 258.
Microscopic Differential Diagnosis by Means of Histochemical Reaction of Cholesterol in Experimental Tumors. X. Chahovitch.—p. 263.
Cancer Metastases in Osseous System with Especial Consideration of Vertebral Column and of Osteophytosis Carcinomatosa. J. Žemgulys.—p. 266.
Comparison of Character of Cancer in Most Important National and Social Groups of City Population in the Ukraine. A. M. Merkow.—p. 285.
Results of Cytologic Investigations on Tumors. B. Lipschütz.—p. 299.

Effect of Spleen Transplantation on Behavior of Animal Tumors.—Tinozzi found that implantation of the spleen of a normal animal into the abdominal cavity of a tumor animal effects a gradual regression of the growth of the tumor, and even complete cicatrization, provided the tumor is not too large. This effect is due to two factors, a nonspecific one and a specific one. The first is due to a gradual disintegration of the transplanted spleen, which effects a stimulation of the defensive powers of the reticulo-endothelial system; the second is due to the liberation of the specific antitumor substances of the spleen. However, if the tumors are unusually large, the transplantation of the spleen tissues does not effect a regression of the tumors. On the contrary, it appears as if following transplantation the growth of the already large tumor progresses more rapidly. The author thinks that this is due to the fact that the defensive powers of the reticulo-endothelial system are already largely in use, and as far as they are still available they are utilized first in the resorption of the transplanted material.

Significance of Reticulo-Endothelial System for Growth of Blastoma.—Brüda demonstrates an inhibitory influence of the spleen on the growth of blastoma in experiments in vivo and in vitro. In splenectomized rats as well as in the plasma of splenectomized animals, heterologous (mice) tumors could be cultivated. However, when the spleen was not excluded, the cultivation of heterologous tumors did not succeed. The reticulo-endothelial system, of which the spleen is a part, exerts the same influence. If this system is excluded by storage with electronegative colloids, the cultivation of heterologous inoculation tumors is possible, and tissue cultures of blastomas succeed in the plasma of animals in which the reticulo-endothelial system has been blocked by storage. The inhibitory action of the reticulo-endothelial system on tumor growth can also be excluded by roentgen irradiation. The author asserts that the checking of the blastoma growth is due to an internal secretion which the spleen and the other parts of the reticulo-endothelial system excrete into the blood and lymph streams.

Reactions in Cancer Patients Caused by Malaria and Their Relations to the Reticulo-Endothelial System.—Braunstein points out that, in regions free from malaria, cancer is much more frequent than where malaria is prevalent. As an example he cites Denmark and Serbia. Denmark, which is practically free from malaria, has fifteen times as many cancer cases as Serbia, where malaria is prevalent. From this observation the author assumed a relationship between cancer and malaria and came to the conclusion that the enlargement of spleen and the activation of the reticulo-endothelial system, which are caused by malaria, result in the production of larger amounts of anticarcinomatous substances. In order to determine whether the reticulo-endothelial system of patients with cancer could be activated by inoculation with malaria, six patients with inoperable tumors were inoculated with tertian malaria. As a result the tumors became painful and hyperemic, and later the tumor tissues disintegrated and a temporary regression was observed. The author concludes that malariotherapy of cancer may prove helpful as a prophylactic measure in patients in whom cancer is suspected, and also in the initial stage of cancer. However, in advanced cases, when the organism is no longer capable of producing sufficient quantities of anticarcinomatous substances, malariotherapy is not enough and treatment with anticarcinomatous substances that have been obtained from other organisms is necessary.

Klinicheskaya Meditsina, Moscow

12: 145-212 (Feb.) 1931

Relationships Between Dystrophies of Pelvisacral and Spinal Region. N. I. Baykov and B. F. Basov.—p. 145.
Thickness of Skin in Diagnosis of Tuberculosis of Extremities. E. Y. Kalikhman.—p. 160.
Antigen Therapy in Tuberculosis. T. P. Panchenkov.—p. 163.
Azotemia and Azoturia in Tuberculosis. S. M. Leytes and D. M. Ebich.—p. 168.
*Reticulocytes in Tuberculosis and Koumiss Treatment. A. L. Vilkoviskiy.—p. 178.
Pneumothorax in Pulmonary Tuberculosis in Diabetes. A. V. Davidov.—p. 182.
Lipoids and Resistance to Tuberculosis. L. M. Modell.—p. 186.
Sedimentation Test in Tuberculosis. M. Soskind.—p. 191.
Sedimentation Test in Tuberculosis of Bone and Joints. B. P. Popov.—p. 195.
*Liver Diet in Secondary and Tuberculous Anemia. C. V. Kaufman.—p. 200.
*Atropine in Pulmonary Hemorrhage. M. P. Stepanova.—p. 209.

Effect of Koumiss Treatment on Reticulocytes in Tuberculosis.—Vilkoviskiy's observations included a study of sixty-five tuberculous and ten normal persons. Using Pappenheim's method of staining, differential counts, hemoglobin and fibrin content were studied during periods of from two to four weeks. He found that koumiss caused no change in the proportion of reticulocytes in the normal individual. The reticulocyte count in the majority of tuberculous patients, with complete compensation of the heart, did not deviate from the normal and did not change under treatment. Increase in reticulocytes was found to go hand in hand with decompensation of the heart, and a decrease was apparent only in extremely toxic conditions of tuberculosis. During koumiss treatment, as the tuberculous condition with decompensation of the heart and the toxic process improves, the proportion of reticulocytes decreases and approaches the normal. The author believes the shift in the erythrocyte schema should prove of great importance in the study of tuberculous intoxication as well as a good control test of treatment.

Liver Diet in Secondary and Tuberculous Anemia.—Kaufman found that, in 79 per cent of the cases, incorporation of liver in the diet of anemic tuberculous children resulted in an increase in the red blood cells and hemoglobin, improvement in the leukocytic picture, and delay in the sedimentation reaction. Increase in weight and well being was also noted in the controls; but there was no significant change in erythrocytes, leukocytes and hemoglobin; and the sedimentation was delayed to a much smaller degree than in the tuberculous group. The urobilin content of the urine was decreased during liver treatment. The author's own results and those gathered from a review of the literature lead him to recommend the introduction of liver into the diet of all tuberculous patients.

Atropine in Pulmonary Hemorrhage.—Stepanova describes her results in eight instances in which atropine was injected subcutaneously in 0.5 to 1 cc. doses of a 1:1,000 solution. She agrees with other workers that hemorrhage and perhaps thrombopenia are often the result of vagotonia. The action of atropine decreases the tonicity of the vagus nerve, leading to increased blood calcium and decreased spasm of the muscles of the small bronchi. In many cases atropine lowered the temperature and in all cases relieved the hemorrhagic condition.

9: 473-544 (July) 1931

Nature of Compensation. N. A. Kabanov.—p. 473.
Id.: E. I. Tsukershtein.—p. 483.
Clinical Significance of Babinski Reflex. F. N. Dosujkov.—p. 490.
*Cardiovascular System in Acute and Chronic Articular Rheumatism. D. M. Korobov and M. I. Mekler.—p. 497.
*Cyanosis in Stagnation of Pulmonary Circulation. M. M. Pismarev.—p. 505.
Musical Heart Sounds. R. L. Manvelyan.—p. 510.
*Colloid Chemistry of Blood in Nephritic Arteriosclerotic Hypertonia. F. F. Borisenko.—p. 512.
*Combined Influence of Adonidin and Convallarin. Ya. Kh. Nolle.—p. 517.
Dicrotic Pulse on Sphygmogram. A. P. Pressman.—p. 523.
Nonsyphilitic Infections of Aorta Among Students. N. P. Likhacheva and E. Ya. Barvish.—p. 526.
Muscle Extract in Angina Pectoris and Other Diseases. Ya. C. Shvartsman.—p. 531.

Cardiovascular System in Acute and Chronic Articular Rheumatism.—Korobov and Mekler made the following observations after a study of 663 cases of various arthritic infections: Many polyarthritic forms of acute rheumatism do not leave any functional or physical changes in the condition of the heart. The heart is normal in from 5 to 9 per cent of the acute and in 33⅓ per cent of the subacute articular rheumatic conditions. In the development of the clinical picture of rheumatic endomyopericarditis, the course is that of polyarthritis and the involvements are articular, cardiovascular and pericardiac. Abatement of the cardiac condition leads to a decrease in auscultatory symptoms (the disappearance of muffled sounds and appearance of the clear heart tone); the limits of cardiac dulness decrease; and the temperature returns slowly to normal. This all takes place within a period of one, two or three months, corresponding to the development of mitral stenosis. In 86.6 per cent of the cases the beginning of the development of endomyocarditis takes place during the first days of the development of the articular infection; there is increased temperature at first and later normal and even subfebrile (37.1 to 37.4 C.) temperature. Their study showed the greatest proportion to consist of both endocarditis and myocarditis and less often just partial or complete myocarditis. Advanced rheumatic myocarditis was characterized by bloatedness of the face, dilatation of the heart toward the right, absence of the first heart tone, increase in size of the lungs, a slight tachycardia or even bradycardia at rest, tachycardia at times with small physical reinforcements, low blood pressure, maximal and minimal monothermia, albuminuria, cylindruria, difficulties in respiration, constriction of the chest and pains in the region of the heart. Valvular endocarditis was characterized by the early appearance of systolic murmurs which changed in location, beginning in the region of the chest, third rib to the left, and deviating the second heart sound toward the pulmonary artery; there was an increase in the size of the spleen, often the presence of bloody urine, and a subfebrile temperature. Systolic murmurs were present not only in marked endocarditis but also in endocarditis of the chordae tendineae, myocarditis in the nipple region and dystrophies of the bicuspid valve. Specific localization could be determined only by follow-up study from the beginning. Disappearance of systolic murmurs did not serve as proof that there had been a valvular endocarditis involvement and that the condition had improved; such deductions can come only from observation during the period of the development of mitral stenosis (from eight to twelve months). In their experience true endocarditis never improved without leaving some marks. Their study of the length of the period in the growth of mitral stenosis proved that termination of the process was never before the sixth month and the diagnosis of the heart condition was never possible till that time.

Cyanosis in Stagnation of Pulmonary Circulation.—Pismarev's studies lead to the following conclusions: Cyanosis as a sign of difficulty in the lesser circulation in consequence of mitral stenosis and decompensation is caused by anatomic changes in the capillaries of the pulmonary artery and a disturbance in the peripheral blood circulation. The pathologic changes in the lungs together with changes in the pulmonary arterial system during mitral stenosis, and the changes in the alveoli themselves during emphysema in combination with sclerosis of the pulmonary artery, lead to a disturbance in the gaseous exchange. Single or multiple causes of stenosis in view of various kinds of stagnation in the lesser circulation are present not only in sclerosis of the pulmonary artery and emphysema but also in the disturbance of the peripheral blood system.

Colloid Chemistry of Blood in Nephritic Arteriosclerotic Hypertonia.—Borisenko makes the following observations as a result of his studies, which included sixteen cases of chronic nephritis, twelve cases of arteriosclerosis and six miscellaneous cases. He concluded that there was no relation between high blood pressure, on the one hand, and surface tension of the blood serum and osmotic resistance of the erythrocytes, on the other. Low surface tension is explained by the colloid composition of the serum—low protein (globulin and fibrinogen) dispersion. His studies of chronic nephritic and arteriosclerotic conditions revealed the presence of a low surface tension, a disturbance of lipoid metabolism toward an increase in serum lipoids, and an increase in hydrogen ion concentration; the maximal osmotic resistance of the erythrocytes was increased, while the minimal value was decreased.

Combined Influence of Adonidin and Convallarin in Cardiac Conditions.—Nolle began his study believing that the combined effect of some therapeutic agents may be far superior to the use of each separately. The doses of adonidin and convallarin in his experiment ranged from 1:1,000 to 1:40,000. His conclusions were as follows: Adonidin in large doses caused an increase in rhythm and a decrease in amplitude. There was no cumulative action and the substance diffused easily. Convallarin in large doses caused a slowness in rhythm and a decrease in amplitude ending at times in stasis of the heart. Convallarin had a cumulative effect and diffused with difficulty. Convallarin was more toxic than adonidin. Combination of the two in small doses (1:40,000 plus 1:40,000) caused a marked retardation of rhythm and a marked increase in amplitude. The effects of the combination were markedly greater than the sum of the effects of each in similar small doses (1:40,000) administered separately. It was found that administration of adonidin (1:2,000) counteracted the drastic effect produced by a previous administration of convallarin (1:4,000). The combination of medium doses of adonidin with small doses of convallarin was more favorable than the combination of small doses of adonidin with medium doses of convallarin. The author cautions against the cumulative action of convallarin.

Ugeskrift for Læger, Copenhagen

93: 787-808 (July 30) 1931

*Sudden Death from Heart Failure in Adults. W. Munck.—p. 787.
Hospital Epidemic of Paradysentery. H. Munck.—p. 794.
Three Cases of Undulant Fever. S. Hoffmeyer.—p. 795.

Sudden Death from Heart Failure in Adults.—Munck's material comprises 130 cases in which necropsy was done. In 74 cases, in persons mainly between the ages of 50 and 70, death was due to disease of the coronary arteries, from simple sclerosis to all its resulting conditions, in 23 cases to pure disorders of the myocardium or of the heart valves, while syphilitic aortitis with its special localization in the ascending aorta caused sudden death in 33 cases, or 26 per cent of all the cases, at an average age of 45. There was a marked preponderance of men over women. In many cases there was not any information concerning an immediate cause of the sudden death.

93: 809-828 (Aug. 6) 1931

*Continued Hematologic and Clinical Investigations in Ulcerous Anginas. A. Buch.—p. 809.

Continued Hematologic and Clinical Investigations in Ulcerous Anginas.—Buch accounts for two different clinical forms of Vincent's angina. His hematologic studies show that the membrano-ulcerous form, in four cases previously reported, is secondary to infectious mononucleosis, while the ulcerous or ulceronecrotic form, in the fourteen cases that have been reported, is accompanied by a varying blood picture. He is inclined to characterize the Vincent's angina which appears in other diseases of the blood—as in his case of agranulocytosis—as of membrano-ulcerous form. His clinical observations indicate that the ulceronecrotic form starts at the base of the crypts, and retention in the crypts is believed to play an important part in its origin.